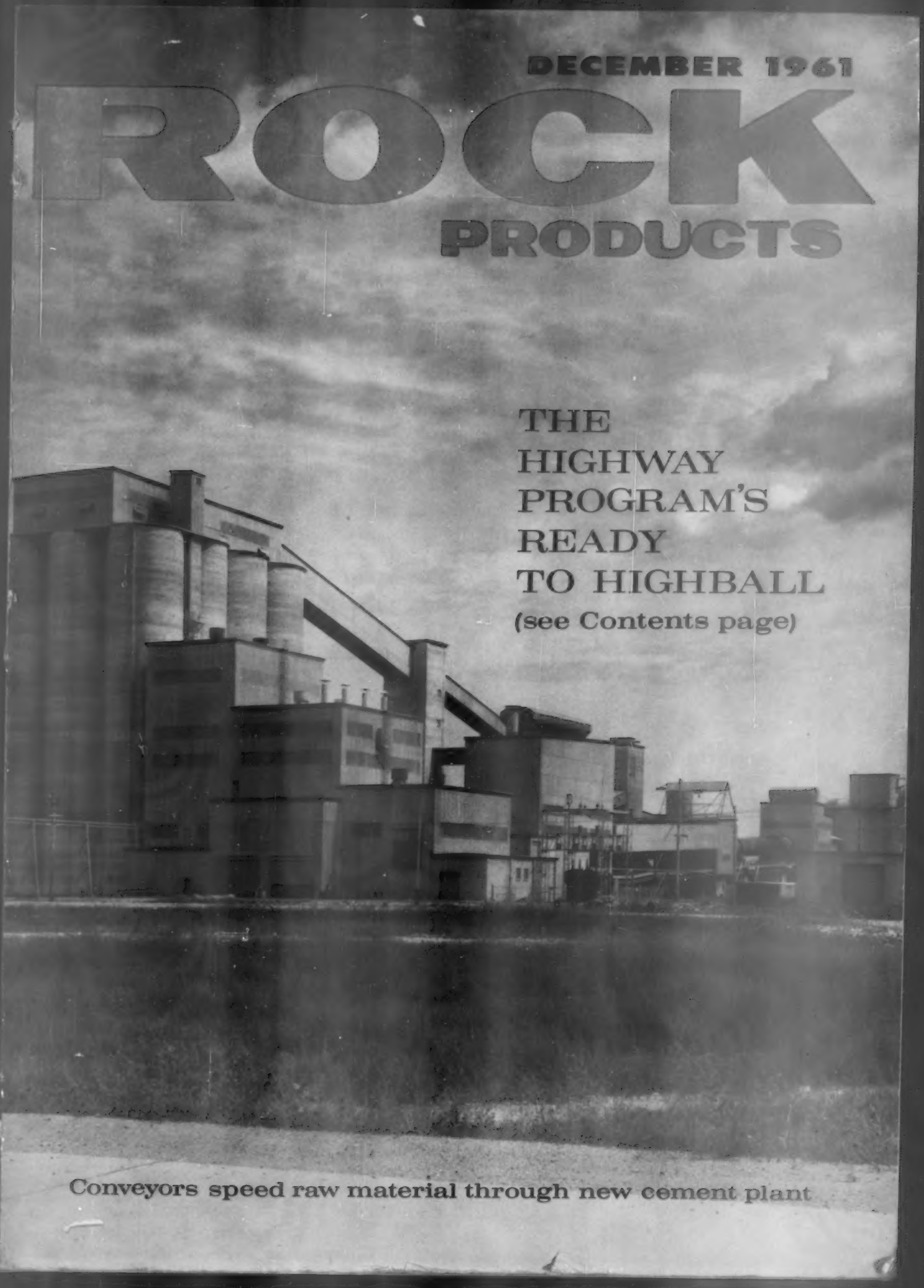
DECEMBER 1961

ROCK PRODUCTS



THE HIGHWAY PROGRAM'S READY TO HIGHBALL

(see Contents page)

Conveyors speed raw material through new cement plant

Therm-O-Flex filter by WP at plant in Barberton

Cement makers in Ohio... and in California...agree:

Precipitator by WP at plant near Los Angeles

When DUST is your problem— CLEAR IT WITH WP*

For an efficient, economical solution to any dust control problem—look to Western Precipitation. WP is uniquely fitted to handle your unique problem—being the one organization that custom designs, engineers and installs ALL types of dust and fume control equipment: Precipitator, Mechanical, Jet-Cleaned Filter, Hi-Temp Filter, scrubbers and engineered combinations.

With no axes to grind for any one system, WP engineers will give your job a completely unbiased recommendation—whether it's a quote on your specifications, a single component, or a completely engineered installation.. small, major, simple, or complex.

An inquiry—on your business letterhead—will bring you literature promptly. Just write Western Precipitation, 1000 W. 9th St., Los Angeles 54, Calif. (In Canada, write 8285 Mountain Sights Ave., Montreal, P.Q.)

Dust and fume control since 1907

*WESTERN PRECIPITATION

Los Angeles 54 • New York 7 • Chicago 2 • Pittsburgh 22 • Atlanta 5 • San Francisco 4

Division of Joy Manufacturing Company

ELECTROSTATIC Precipitators
MULTICLONE Collectors
CMP Combination Units
DUALAIRE Jet-Cleaned Filters
THERM-O-FLEX Hi Temp Filters

TURBULAIRE Scrubbers
JOY-MICRODYNE Scrubbers
also: **HOLO-FLITE** Processors
HI-TURBIANT Heaters
TURBULEX Calciners

MEMBER OF INDUSTRIAL GAS CLEANING INSTITUTE

River of rocks flows over river of water

Aggregate for Ice Harbor Dam project delivered by B.F.Goodrich belt

WHAT do you do when the dam you're building is on one side of a river, the aggregate you need is on the other?

Engineers on the Ice Harbor Dam project built a "belt-bridge" to span the 920-foot width of the Snake River. A single conveyor belt moves the rock, sand, gravel across the bridge, then takes it another 270 feet on up to the batching plant.

B.F.Goodrich men, working with the contractor, recommended that the rubber belt be made with BFG Nyfil fabric. Nylon used for cross threads in the fabric adds extra strength to the belt so it can stand wear and tear that causes other belts to break down.

According to the engineers, the B.F.Goodrich belt is doing an excellent job of carrying the 660-ton-per-hour loads of jagged rock. After hauling the 1¼ million tons on this job, it'll probably be moved to another construction site for more years of service.

Your B.F.Goodrich distributor has full information about this Nyfil belt. And, as a factory-trained specialist in rubber products, he can answer your questions about any of the rubber products BFG makes for construction work. *B.F.Goodrich Industrial Products Co., Dept. M-202, Akron 18, Ohio.*

B.F.Goodrich

CONVEYOR BELTS

Enter 1225 on Reader Card

ROCK PRODUCTS

a Maclean-Hunter publication, Vol. 64, No. 12

PHILIP D. ALLEN, General Manager
NATHAN C. ROCKWOOD, Editor Emeritus

Editorial

GEORGE C. LINDSAY, Editorial Director
ELWOOD MESCHTER, Executive Editor
CHARLES R. KLUGE, Managing Editor
JOHN H. BERGSTROM, Western Editor
MILDRED K. SMITH, Associate Editor
ENID W. STEARN, Associate Editor
MEGAN R. THOMAS, Editorial Assistant
PATRICIA E. NOLAN, Editorial Assistant

JOSEPH N. BELL, Special Features Editor
WALTER B. LENHART, Consulting Editor
DR. ARTHUR GOULD, Editorial Consultant

Contributing Editors

VICTOR J. AZBE, OLIVER S. NORTH
PETER B. B. ANDREWS, EDGAR POE
DR. H. B. CHARMBURY

Business

CECIL M. HANCOCK, Production Manager
ELAINE E. EGGE
Assistant Production Manager
JAMES J. S. CHUN, Director of Research
CARL G. FINETTE
Visual Presentation Director

Circulation

RICHARD C. LUKENS, Director
CLARENCE P. TEATS, Field Representative
LOUIS J. HADDAD, Field Representative

District Sales Offices

EASTERN AREA—Reginald W. Davis, *Associate General Manager;* Charles H. Daly, *District Manager,* 341 Madison Ave., New York 17, N.Y., Telephone: Oregon 9-8266

CENTRAL AREA—Evans J. Kall, *Manager, Central Area;* Landon W. Myers, *District Manager,* 149-A Shaker Building, 3645 Warrensville Center Rd., Shaker Heights 22, Ohio, Telephone: Skyline 1-3886

WESTERN AREA—George K. Kons, *Associate General Manager;* Charles L. Lemperly, *District Manager,* 79 W. Monroe St., Chicago 3, Ill., Telephone: Randolph 6-2802

SOUTHWESTERN AREA—Richard E. Hoierman, *Representative,* 9086 Capri Dr., Dallas 18, Texas, Telephone: Diamond 8-1229

PACIFIC AREA—Duncan Scott & Co., *Representative,* 85 Post St., 5th Floor, San Francisco 4, Calif., Telephone: Garfield 1-7950; 1901 W. 8th St., Los Angeles 57, Calif., Telephone: Hubbard 3-6211

FOREIGN—James H. Bedford, *Managing Director,* Maclean-Hunter Ltd., Trinidad House, 28/30 Old Burlington St., London, W. 1, England; O. E. Boline, *Representative,* Zeill 77, Frankfurt Am. Main, Germany, Telephone: 2-5915

December 1961

In this issue

80 The Highway Program's ready to highball
by JOSEPH N. BELL

84 Conveyors speed raw materials through new cement plant
by ELWOOD MESCHTER

90 It's the end of an era in Chicago

95 Safety—from A to Z

96 Television goes underground

98 Plain talk on safety . . .
. . . or the lime industry at the crossroads

100 Safety is the badge of a pro
by ENID W. STEARN

102 Cooperation breeds success . . .

104 Special machinery pays off
for underground limestone producer

108 Aggregates production at dams, *Part 5*
Southern dams call for innovations
by WALTER B. LENHART

154 Annual ROCK PRODUCTS Index for Volume 64

Departments

72 Calendar
18 Editorial
76 Hints & Helps
47 Industry News
38 Labor Relations
142 Manufacturers News
122 New Literature
126 New Machinery
40 People in the News
24 Rocky's Notes
121 Truck Talk
29 Washington Letter
11 What's Happening

ROCK PRODUCTS magazine is published monthly by Maclean-Hunter Publishing Corp., 79 W. Monroe St., Chicago 3, Ill.; P. D. Allen, President. Copyright, 1961, by Maclean-Hunter Publishing Corp. Second-class postage paid at Chicago, Ill. and at Long Prairie, Minn. *Subscription Information*—Subscription price: United States and possessions, Canada, one year, $3.00; two years, $4.00; three years, $5.00; U.S., single copy, 50¢. Pan-American, one year, $8.00; two years, $14.00; three years, $20.00; all other foreign, one year, $12.00; two years, $22.00; three years, $30.00; single copy, $1.00. Canadian subscriptions and remittance may be sent in Canadian funds to ROCK PRODUCTS, P.O. Box 100, Terminal "A," Toronto, Canada. *To subscribers:* Date on wrapper indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address. ROCK PRODUCTS is indexed regularly by Engineering Index, Inc. and Industrial Arts Index.

Operator of this 1¼-yd. P&H says Magnetorque swingers are the main reason it cycles as fast as a good ¾-yd. machine. The P&H is easy to handle, and it's easy on cable too.

1¼-yd. P&H clamshell with Magnetorque swingers

AVERAGES 4000 TONS PER 10-HR. DAY

Fyfe Sand Company, Concordia, Kas., standardizes on P&H cranes because "these fast producers have really helped us to grow and kept this a profitable operation..."

Ernest R. Fyfe

"In a portable sand and gravel operation like ours," says Ernest R. Fyfe, "crane speed is particularly important. You have to start from scratch and produce aggregate faster than the trucks can haul it away. Since our P&H's are much faster than other machines we've tried, we use them exclusively.

"The 1¼-yd. clamshell is our workhorse ... and we can count on it for up to 400 tons hourly," continues Fyfe. "We also own three P&H ¾-yd. clams and three P&H ½-yd. clams which average 250 and 150 tons per hour. With this P&H fleet—plus three barge-mounted pumps and diggers—we can field three portable rigs at the same time.

P&H performance is the key to profit. Fyfe summarizes—"Magnetorque swingers are fast, smooth, even, and with full-feel hydraulic controls our P&H's handle smoothly, respond quickly, are easy on the operator. They have good travel ability, excellent stability. We can drive them right up and onto 40-ft. stockpiles. These factors—combined with good durability and low maintenance cost—give us the fast, economical production we need."

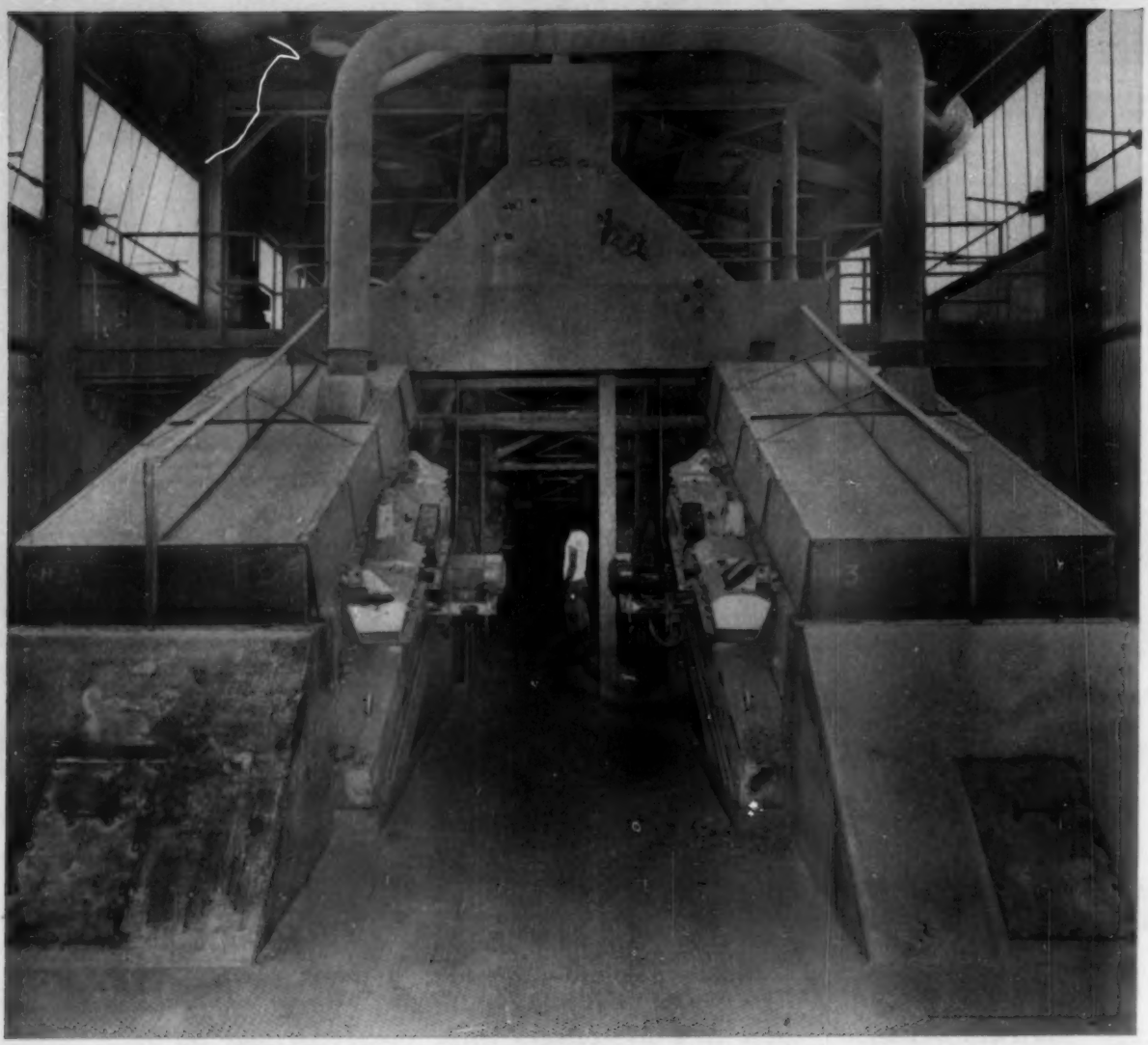
For more information on this job, contact your distributor or write direct and ask for Case History Report No. 163.

This 1¼-yd. P&H has produced for Fyfe since 1958, averaging 350 tons hourly. Records show servicing time at only 20 minutes per 10-hr. day ... cost of lubricants only half that expected for a machine of this size on this kind of work.

HARNISCHFEGER P&H

Milwaukee 46, Wisconsin

61-592



"NO REPAIRS SINCE INSTALLATION" FOR THESE HIGH-CAPACITY TY-ROCK SCREENS

This group of five 5' x 14' F-600 Ty-Rock screens is used on final sizing at the Bogota, New Jersey, plant of Geo. M. Brewster and Son, Inc., where the company processes crushed stone for the spectacular George Washington Bridge conversion project. Their superintendent reports "There have been absolutely no mechanical repairs of any kind—only normal replacement of parts and screen cloth sections in contact with stone." This is another application where Tyler screens handle tremendous outputs with very high reliability. Check Tyler for a full range of vibrating screens for all types of requirements.

TYLER CUTS YOUR COST OF SCREENING • Requirements matched from world's broadest line of wire cloth • Fast shipments from the industry's largest inventory • Technical service backed by unique Customer Service Laboratory.

MAN WITH 50,000 SAMPLES

Tyler field engineers can carry only a representative group of wire cloth samples—but they are backed by over 50,000 specifications in different types, sizes, metals, meshes, and designs. Tyler produces world's broadest line of wire cloth—your assurance of unbiased recommendations and exact matching to your needs.

THE W. S. TYLER COMPANY
Cleveland 14, Ohio

TYLER

OFFICES: Atlanta • Boston • Chicago • Dallas • Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City • San Francisco • THE W. S. TYLER COMPANY *of Canada, Limited*, St. Catharines, Ontario • OFFICE: Montreal

Enter 1201 on Reader Card

Enter 1202 on Reader Card

This Big Florida Operation

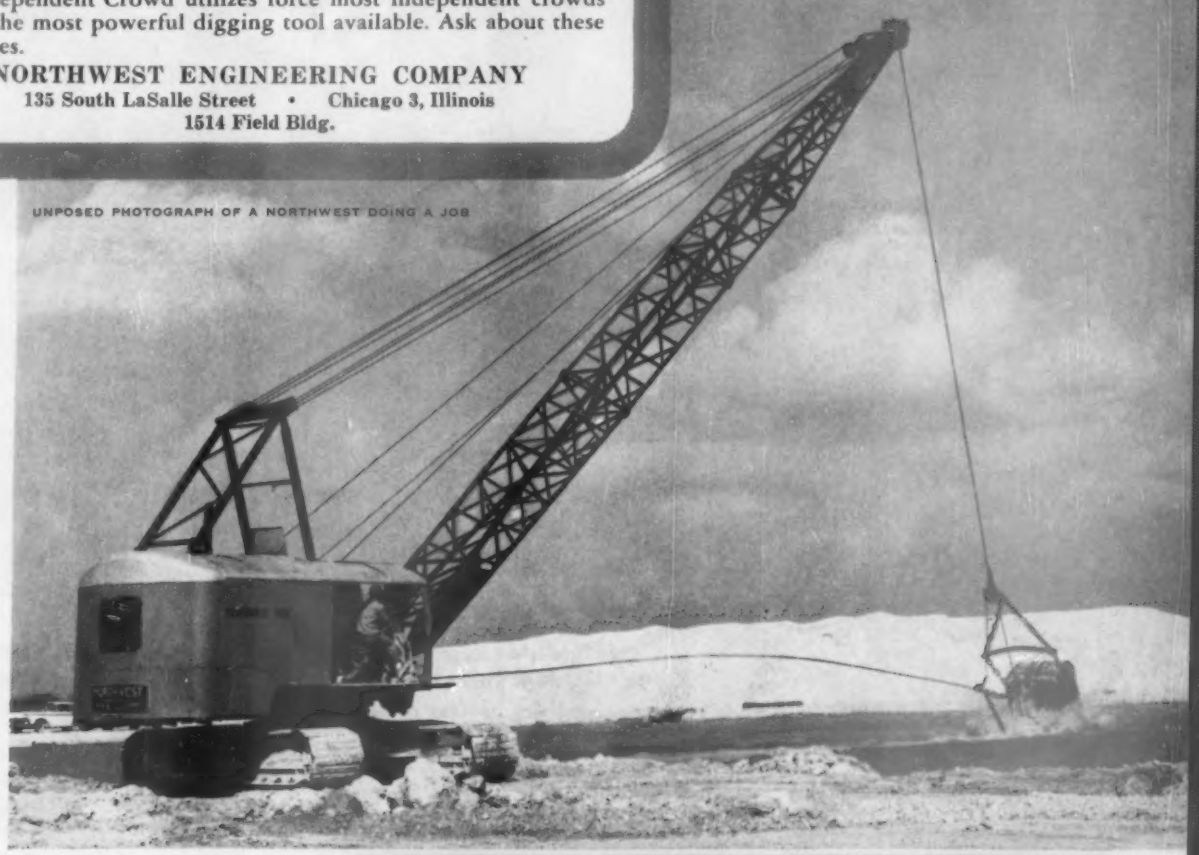
KEEPS MACHINES HUSTLING

Seminole Rock Products, Inc., think big! Seven Northwest Draglines keep things on the jump 10 hours a day at their big pits near Miami. Model 41's are used to load trucks and railroad cars . . . 95's splash their 3 yd. buckets into the pond to bring up aggregate from 40 ft. down.

Here again repeat orders on a big, growing operation prove Northwests make money — get the job done — demonstrate unqualified user satisfaction. Whether your problem is a wet dragline operation like this, a clamshell job with a bin setup, or a hard rock quarry that calls for a shovel, Northwest advantages make Northwest your best investment.

You have a range of crawler widths and lengths with either Block & Skid or Differential Steering. Quickly removable Counterweight cuts the load when operating different pits. Smooth, easy operating Uniform Pressure Swing Clutches bring accuracy to spotting a load to truck or grizzly. The Feather-Touch Clutch Control gives the "feel" of the load to a degree impossible with any air or hydraulic control. There is a wide range of crane advantages. Torque Converters are available, and in shovel work the Northwest Dual Independent Crowd utilizes force most independent crowds waste — the most powerful digging tool available. Ask about these advantages.

NORTHWEST ENGINEERING COMPANY
135 South LaSalle Street • Chicago 3, Illinois
1514 Field Bldg.



UNPOSED PHOTOGRAPH OF A NORTHWEST DOING A JOB

D-95-17-S

You can say... "THEY'RE ALWAYS READY TO GO!"

3/4 to 4 1/2 Cubic Yard Capacity

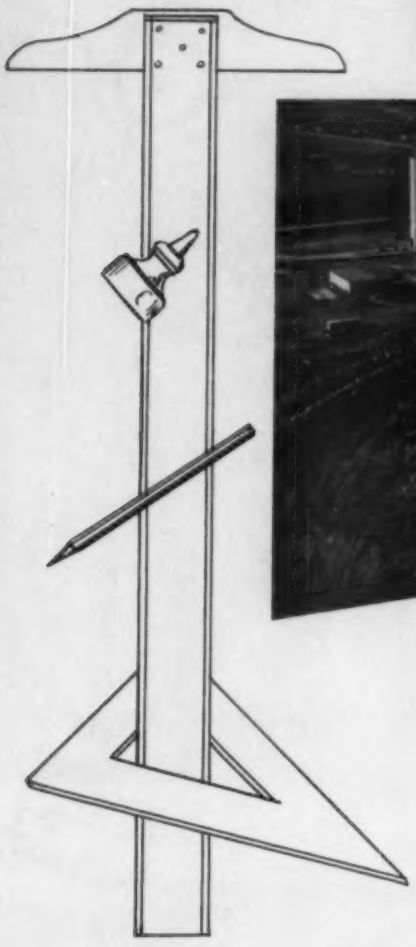
NORTHWEST

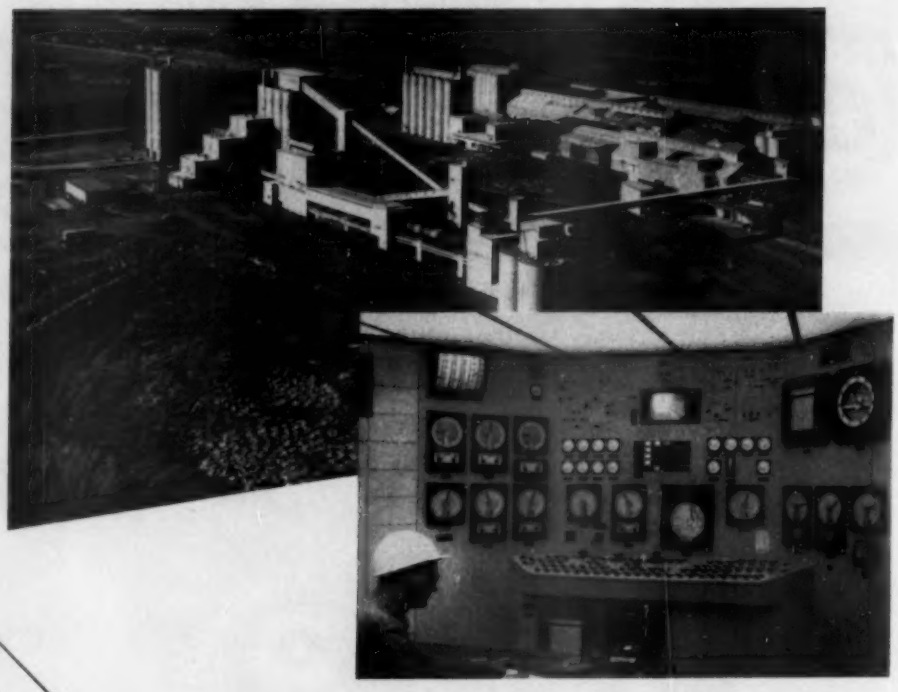
NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 60-Ton Capacity	¾ Yd. to 3 Yd. Capacity

PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	25-Ton and 45-Ton Capacity

SPECIALISTS IN DESIGN AND CONSTRUCTION





This is an overall view and the kiln control room of Northwestern States Portland Cement Co.'s new 3,500 bbl. per day dry process cement plant at Mason City, Iowa

Designed & Constructed

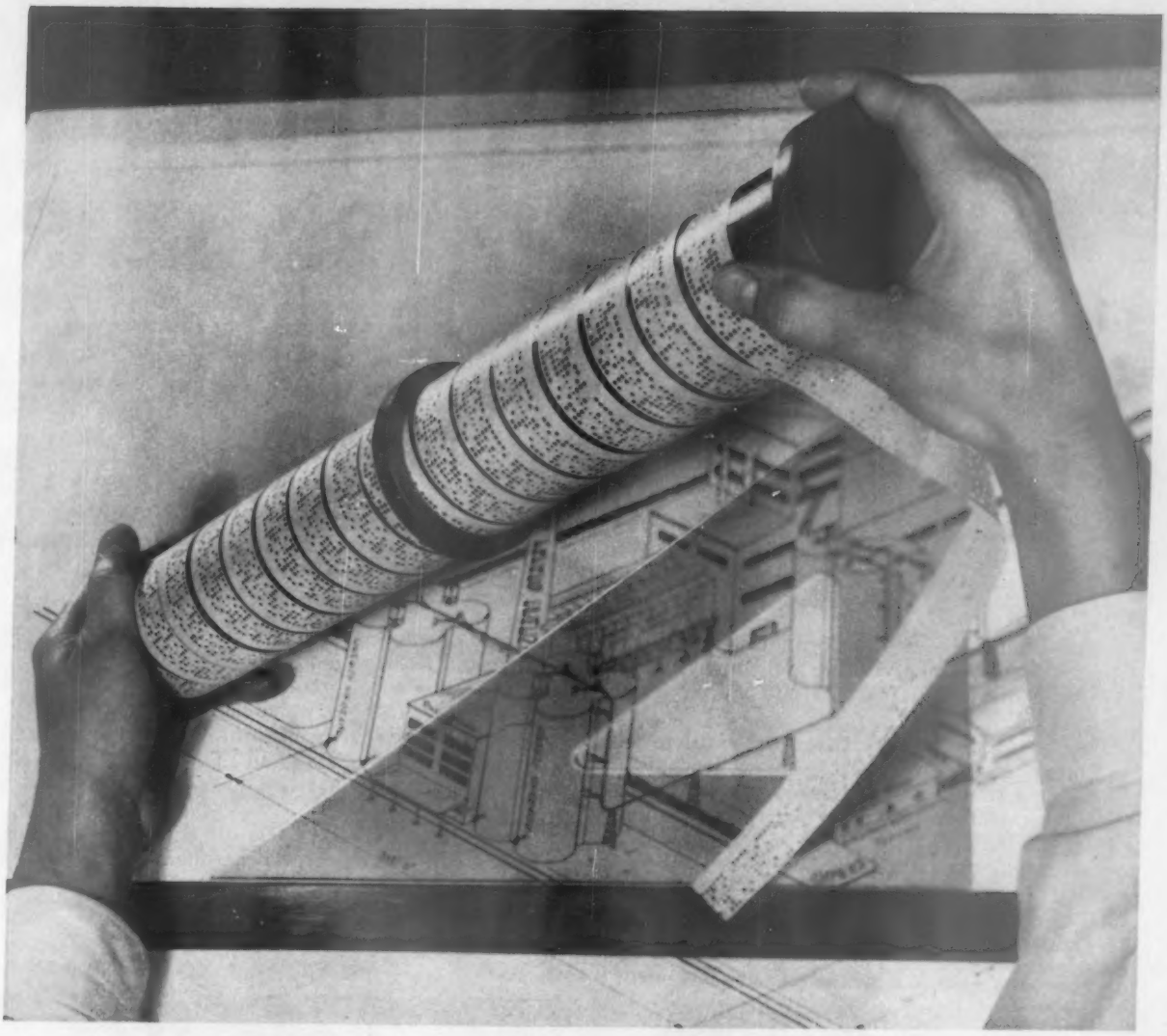
by

MACDONALD ENGINEERING CO.

22 W. MADISON STREET

SAN FRANCISCO, CALIF. CHICAGO, ILL. TORONTO, CANADA

Enter 1266 on Reader Card



Traylor designs a multitude of kilns by computer

. . . to make sure you get the one design that's best for you

Before the kiln you order gets into metal—before it even reaches the drawing board—Traylor engineers develop from their computer the preferred design variations appropriate to your requirements, including maintenance.

Stored on punched paper tape is the knowledge and experience of many engineers over many years. Months of calculations are done in days or hours. Traylor engineers are freed from routine and repetitive computations for the more creative task of *evaluation* . . . determining which of the almost infinite combinations of vital variables will assure you the best kiln design, the highest thermal efficiency not only of the kiln itself but of auxiliary equipment, too.

The Traylor computer is programmed to solve many major problems in addition to basic kiln design . . . including clinker cooler air and heat balance, dew point of kiln exhaust gases, analysis of kiln heat and air flow.

Through its own facilities and those of Fuller Company, Traylor brings to bear on your kiln problems a breadth of process know-how long recognized by industry as unexcelled.

Call in Traylor early in your plans. Write outlining your requirements. Traylor experience is at your service. Literature is available on request.

See Pit and Quarry Handbook for details and specifications.

Traylor

TRAYLOR ENGINEERING & MANUFACTURING

DIVISION OF FULLER COMPANY

1557 MILL STREET • ALLENTOWN 1, PA.

4170
TKA-14

Enter 1203 on Reader Card

MOUNTAIN-MOVING BELT CONVEYORS IN 12th YEAR WITH ORIGINAL IDLERS

Barber-Greene conveyor system still going strong after handling up to 830,000 tons yearly for Blue Ridge Stone Corp.

The Blue Ridge Stone Corp., Roanoke, Va., is blasting, trucking, crushing and conveying away a limestone mountain at the rate of up to 830,000 tons yearly.

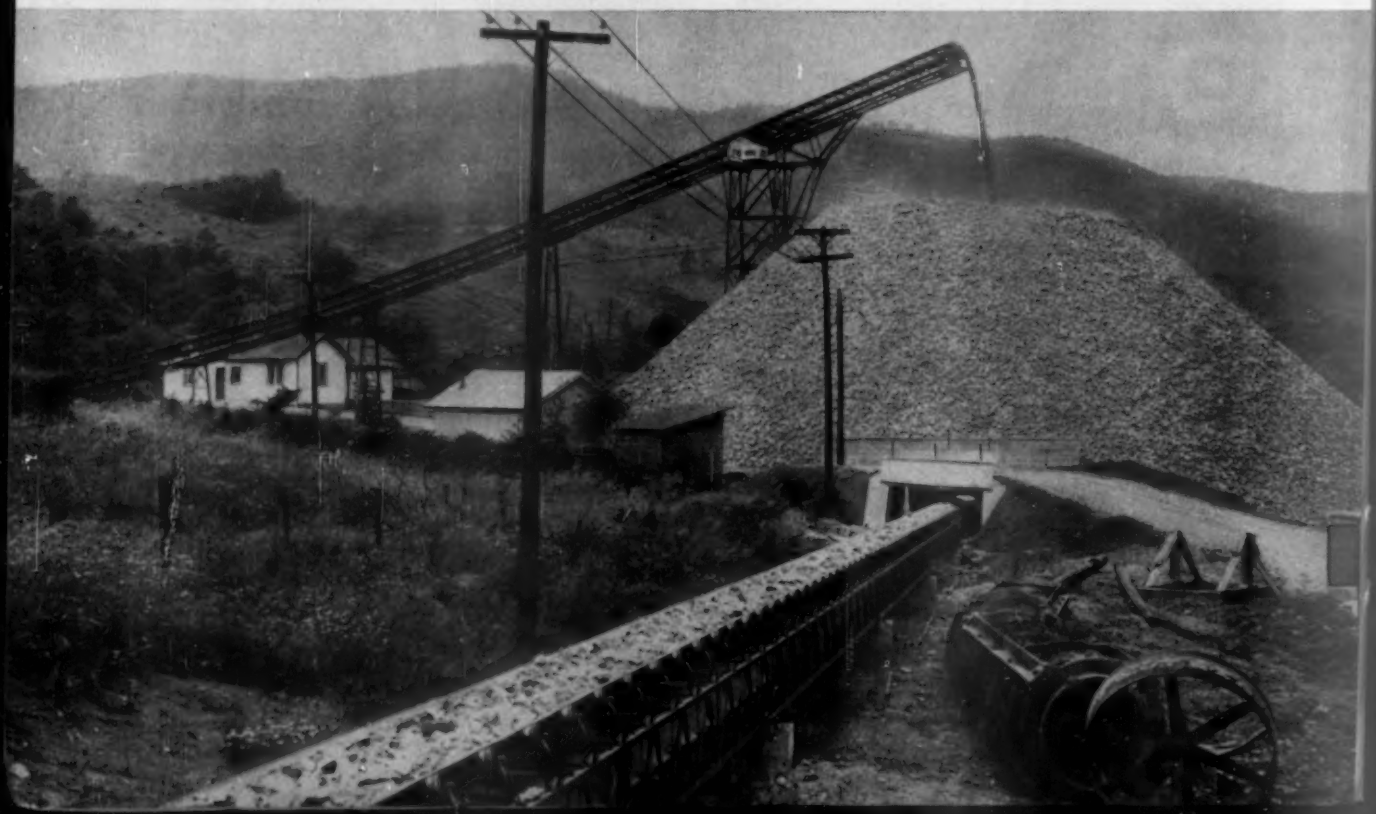
After trucks make the short haul moving blasted rock from face to primary crusher, a 4-flight, 4,150-ft. Barber-Greene conveyor system hustles the limestone from quarry floor to finishing plant.

President Abney Boxley observes, "We've increased production more than 30% over our old all-rail haulage method.

"Since our Barber-Greene conveyors became operative in 1948, we've had 12 years of dependable service with minimum maintenance and downtime. Practically all 1,500 original idlers are still in service and belt life has been extremely good.

"By including a 6,000-ton surge pile ahead of the No. 4 conveyor, we can operate the plant for

6,000-ton surge pile at end of 700-ft. No. 3 conveyor keeps finishing plant operating 24 hours after quarry shut-down. Rock is reclaimed on 1,600-ft. belt leading to finishing plant.



After double reduction of stone in quarry, limestone gets fast ride upgrade on 30" belt of 1,600-ft. Barber-Greene Conveyor enroute to surge pile and then to finishing plant. 4-flight system totals 4,150-ft.

as long as 24 hours after quarry operations have stopped if we bulldoze the stockpile."

Get this same lowest-cost-per-ton-mile solution to your material handling problems by calling your Barber-Greene Conveyor Specialist. He sells pre-engineered and pre-aligned standardized conveyors plus broad design experience . . . a combination that is preferred throughout the aggregate industry for hard-dollar reasons.

Send For New Idler Bulletin

New 44-page Idler Bulletin describes the more than 800 units available in the complete Barber-Greene line, tells how their years-ahead features bring longer life and greater economy to every job. Ask for your copy today.

Your belt conveyor equipment headquarters

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.

Other Plants: DeKalb, Milwaukee, Detroit, Canada, England, Brazil, Australia

CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

Finishing plant is last processing point for stone after 4,150-ft. conveyor ride from quarry. Short conveyor loads truck-loading hoppers. Bulk of output is loaded into railroad cars shown on siding.

Smidth

CEMENT COOLERS

The Smidth Cement Cooler, developed especially for cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging, is externally water-cooled. The hot cement is introduced at the base and conveyed in a thin layer along the cooled interior surface to the top. High cooling efficiency is assured by the intimate contact of cement and the water-cooled surface.

The Smidth Cooler may also be used with many other similar dry pulverized materials.

Illustrated: Two 6′ 6″ diameter by 17′ 7″ high Smidth Coolers ready for shipment.

F. L. SMIDTH & CO.

INCORPORATED

ROCKEFELLER CENTER

1270 Ave. of the Americas, New York 20, N. Y.

WHAT'S HAPPENING

in other fields of interest to the rock products industry

Will a tiny cable ever replace the drivers in your quarry trucks? At a recent American Transit Association convention, a 44-passenger bus made trial runs guided entirely by a cable taped to the pavement. A current running through the cable creates an electro-magnetic field which is sensed by a bar hanging under the bus. This activates the steering and causes it to stop at intervals marked on the tape. Any break in the cable automatically stops the vehicle. The bus is manufactured by Flxible Co., Loudonville, Ohio, and Barrett Electronics Corp., Northbrook, Ill., who assert they've licked all the problems except sales. The electronic equipment adds $5,000 to the initial cost, but a train of the driverless buses could drastically cut rapid transit costs by eliminating track, as well as labor problems. Over 300 self-guided trucks are already handling materials in U. S. factories and warehouses.

A mechanical frogman named RUM (Remote-controlled Underwater Manipulator) is being tested at Scripps Institute of Oceanography, La Jolla, Calif. The 7-ton monster "sees" with four TV cameras and is tethered to shore by five miles of coaxial cable carrying two television channels and 38 control commands.

Education and mining are opposite sides of the coin for employes of Canadian Johns-Manville Co., Ltd. At night they can receive training in any of 26 classes; among them house construction, motor rewinding, mathematics, welding, practical electronics, carpentry and business financing.

Body heat is the operating force for a small Army-developed fresh water still. For a survival water ration, five layers consisting of black plastic film, paper toweling, water repellent screen, aluminum foil and cloth backing on the bottom are dipped into the salt water and the aluminum foil dried. The still is put together and, in the absence of sunlight, the survivor sits on it. Fresh water condenses on the foil and is gathered with a sponge. The name? "Sit Still."

Not a single weatherman will suffer the Arctic climate when the world's first isotope-powered weather station begins functioning on uninhabited Graham Island near Norwegian Bay in the Canadian Arctic. Designed by the U. S. Atomic Energy Commission and the U. S. Weather Bureau, the station can operate unattended for as long as two years. An 8-ft. cylindrical container houses the experiment. In the lower 5 ft., buried in the frozen earth, a strontium-90 heat generator creates electricity to operate the radio transmitter. Above, an anemometer, thermometer and barometer take readings, which are fed into a data processing system and relayed by the transmitter every three hours to the Canadian stations of Resolute and Eureka. A decade's worth of power can be produced by the strontium-90, which is protected by ¾ ton of lead.

Please turn page

Concrete rode in a whirlybird—at least on one west coast project. While erecting three 60-ft. transmission towers in a mountain pass not far from Los Angeles, Southern California Edison Co. transformed its lightweight Hiller 12E helicopter into a ready-mix truck. In 8½ hours flying time, the necessary 18½ cu. yd. of concrete were hauled, preventing a tortuous week-long job of back-packing materials through the Santa Susanna mountains. And all the steel for the towers was delivered by the helicopter in only 45 minutes.

A low-cost liquid for gravity separation may soon be available for the first time. Tetrabromoethane (specific gravity 2.95) is a heavy organic liquid development that may bring this efficient process within the range of large-scale mineral producers using low grade ores.

An air curtain door is no longer particularly rare, but now designers are going it one better. At the 1964 World's Fair in New York City, the exhibit building of Gas, Inc., will use air walls to enclose three sides of its 200-seat restaurant. In the exhibit area a "wall" will be used to restrict air conditioning to the lower section. The $6 million structure is being designed by Walter Dorwin Teague Associates.

A glass blanket is under test for erosion control. "Ultracheck's" effectiveness is supposedly due to the high tensile strength of glass fibers bonded by phenolic resins.

Synthetic gem "growing" has been successfully mechanized, and single crystals of sapphire and ruby are finding continually greater use in the optics (see ROCK PRODUCTS, May 1961, p. 14) and electronics industries. Pure alumina powder is doped with varying amounts of chromium, titanium, iron, vanadium, etc., according to the color and hue desired. Blending takes place under heat. Feeding the material through tubes at different rates and varying the heat intensity produce boules shaped like barrels, rods, disks or spirals. Star rubies and sapphires, which have had the greatest impact on the jewelry market, are made by doping with titania and holding for two weeks at 1,200 to 1,300 deg. C. When cut and polished there's a more brilliant star than any found naturally. Newest synthetic stones are emeralds—chromium-doped beryl grown on surface-clear natural resilient beryl, pre-cut to the desired shape.

"Witchers" and their wishbone-shaped divining branches are still coming to the rescue of puzzled water well seekers. As more scientific means of finding water depend on underground topographical indications of where water ought to be, curiosity and just plain desperation make contractors, builders and even engineers call in a "witcher". The timely bending of a willow, wild cherry or peach tree branch has led to wells for such projects as an El Paso, Texas, housing development and the Case Institute of Technology, near Cleveland. Rough estimates are that some 25,000 "witchers" are currently practicing, and that at least a few old pros are 75 to 85 percent successful. Of course many scoff, but quite a few agree with a Washington University geologist who says: "There's no question about its working, although there is no scientific explanation for it."

GOODYEAR

Q: What do Goodyear Earthmover Rims have that no others have?

A: MORE times FOUR

1. MORE rims on the job: More tons are hauled on—more earth-moving equipment rides on Goodyear rims than on any other kind. Result: You reap the benefits of the widest, soundest experience in rim design, manufacture and use.

2. MORE kinds of rims: Maximum rim performance stems from proper specification. Goodyear makes the *only complete line* of earthmover rims. Result: The choice that permits you to get exactly the right rim for the job.

3. MORE rim engineering help: Goodyear has more engineers designing *and selling* rims than any other company. And they know tires, too. Result: The help you need in choosing the right rim for top performance—longer tire life.

4. MORE rim "firsts": The first *true* earthmover rim, the first 5° rim, the first tubeless rim—in fact, every major earthmover rim advance was made by Goodyear. Result: The very latest in rim design and manufacture at work, for you.

What better reasons for choosing Goodyear as your rim supplier? Only these: The desire and ability to design and build any rim that may be needed for *tomorrow's* earth-moving equipment. No matter what your rim needs or plans, you'll find it pays to call on Goodyear. See your local rim distributor, or write: Goodyear, Metal Products Division, Akron 16, Ohio.

Lots of good things come from

GOODYEAR

Enter 1204 on Reader Card

HOW FAR . . . AND HOW FAST . . .

can you use computer control *profitably?*

BAILEY 700 SYSTEMS CAN HELP YOU DETERMINE THIS—ONE STEP AT A TIME

Can computer control be used—profitably—in your process operations?

Where and how?

The answer often lies in intermediate stages of improvement in sensing, measuring, controlling, computing.

Bailey engineers can help you determine and prove — one step at a time — how far analog or digital systems can be profitably applied in your operations. Bailey is equipped, by broad experience, to provide single-source responsibility from sensing and measuring instrumentation to complete automation. *Bailey 700 Systems* are installed, in operation, or on order, at locations from coast to coast and throughout the world.

Find out what this Bailey background can offer. Contact your Bailey District Office.

SIX STEPS TO FULL AUTOMATION

Centralize and simplify information display—use analog and digital techniques to clarify information, aid operator understanding, improve reliability of interpretation, and save space.

Extend use of interlocks and limiting circuitry—use digital solid-state components to extend supervisory controls, thereby minimizing effects of human error.

Increase use of automatic sub-loops—simplify and standardize the starting, controlling, and stopping of major plant components and sub-systems.

Extend on-line controls—integrate sub-loops, interlocks, and limiting controls with conventional controls to secure automatic operation over full range, once unit is on the line.

Provide performance monitoring—add computing facilities to provide significant up-to-date calculations for operation improvement and maintenance scheduling.

Integrate all system elements—add start-stop control to provide full automation, the ultimate goal.

C 158-1

CEMENT DIVISION

BAILEY METER COMPANY

1039 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

Enter 1205 on Reader Card

McLANAHAN EQUIPMENT

for Mines, Pits and Quarries

Widely recognized as standards of efficiency and dependable service, McLanahan equipment is on duty the world over.

Other McLanahan Equipment Not Illustrated

- Conveyors
- Dry Pans, Super Heavy Duty
- Elevators
- Super Black Diamond and Pioneer Crushers
- Portable and Semi-Portable Crushing Plants
- Scrap Bundlers
- Mixers and Blenders
- Special Machinery

Descriptive bulletins are available on the equipment shown here. Write for copies today.

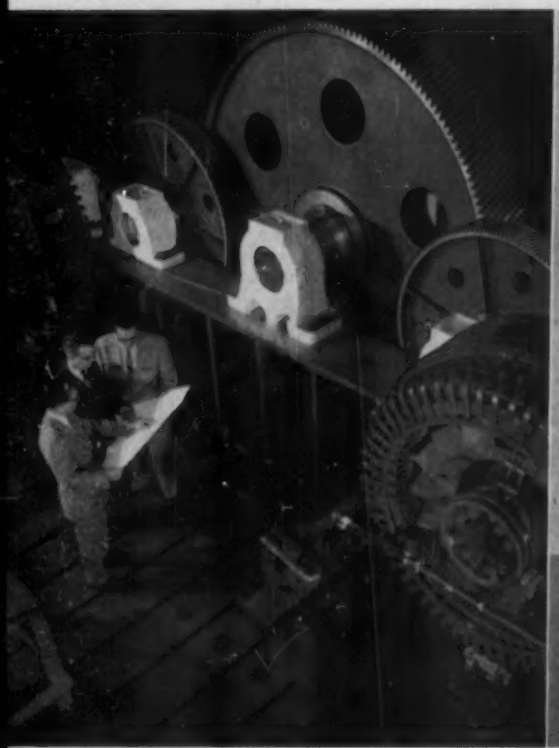
McLANAHAN CORPORATION

HOLLIDAYSBURG, PENNSYLVANIA

PIT, MINE AND QUARRY EQUIPMENT HEADQUARTERS SINCE 1835

Enter 1265 on Reader Card

ideas and news:



Full-load demonstration proves 98%-plus drive efficiency: A-C factory engineers recently demonstrated the high efficiency of TWINDUCER grinding mill drives. It ranged from 98.48% to 98.52%. This exclusive twin motor drive system divides mill load electrically, saves space, installation costs, minimizes gear wear.

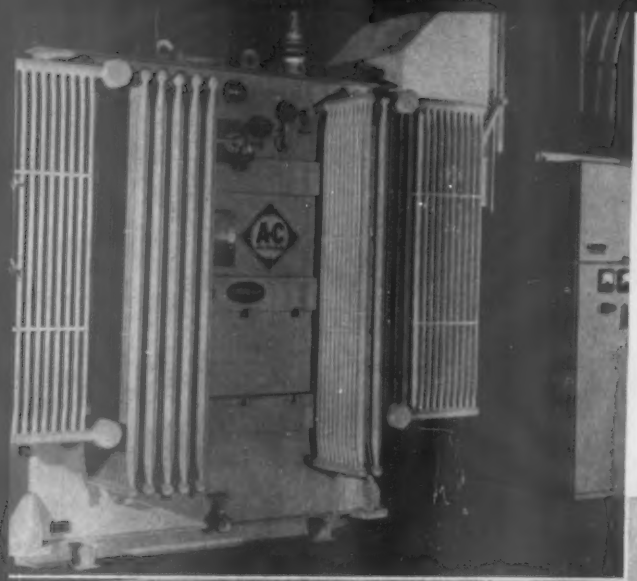
Low-cost system automatically correlates bulk materials handling data: An A-C data-handling system now being installed in a midwestern coal tipple automatically weighs coal shipments and transmits all pertinent data to a central invoicing location. Similar systems in the cement industry, applied to raw materials as well as loading of bulk or bagged cement, provide accurate quantitative data. This system has been developed by A-C through its exclusive **Systemation** service.

Which of these productive ideas could be working for you?

A grinding mill drive that saves power and space. A low-cost data-logging system. A high-voltage motor control center. These examples demonstrate the extra value that is standard with Allis-Chalmers... the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-1553

Twinducer, Chlorextol, Ripl-Flo, SpaceMaker, Pyro-Shield and Shelter-Clad are Allis-Chalmers trademarks. *Systemation* is an Allis-Chalmers servicemark.



A-C transformer offers multiple benefits: Located close to the load center in a Midwest cement plant, this 5000-kva CHLOR-EXTOL filled transformer provides reduced power losses, better regulation, and flexibility for expansion. Types available also include oil-filled, liquid-filled, and dry-type units (both sealed and open).

High-output — low installation costs: One of the world's largest aggregate-handling screens met the needs of an aggregate producer for higher output and minimum installation costs. This 7 by 20-ft RIPL-FLO screen handles 600 tons per hour and is mounted on foundations previously used for a 5-ft screen.

So low, two fit where one used to go: This new SPACEMAKER control center is the first completely new 2- to 5-kv motor controller development in more than a decade. Two-high design can cut floor space needs in half. Full drawout construction makes it the safest, most easily accessible controller available. Flame-retardent, track-resistant PYRO-SHIELD insulation adds reliability. Walk-in SHELTER-CLAD enclosures availabe for outdoors.

A-C INDUSTRIAL EQUIPMENT DIVISION: motors, generators, controls, rectifiers, pumps, compressors, crushers, mills, screens, kilns, coolers, industrial systems.

OTHER A-C PRODUCTS: thermal, hydro and atomic electrical generating equipment; switchgear, transformers, unit substations; tractors, earth-moving equipment, engines, lift trucks.

ALLIS-CHALMERS

EDITORIAL

by George C. Lindsay

There's a *new look* in minerals research

THE CONCEPT OF MINERALS BENEFICIATION in this country is gradually changing, thanks to minerals research. This fact, if recognized fully and adopted in the rock products industries—particularly the aggregates industry—will do much to solve some current and future industry problems. There's evidence that it is doing just this.

A significant trend in minerals research—says Robert J. Brison of Battelle Memorial Institute—"is the gradual abandonment of the time-honored concept of minerals [beneficiation] as an art and its growing recognition as an applied science."

Procedures based on successful methods used in the past do not satisfy today's researchers. They want to know now the answers to such questions as these: What difference is there between physical or chemical properties or reaction in materials to be separated, in beneficiation? How can these differences be used to get economical separation?

Some of the answers have been found by studying technologies in other, sometimes unrelated fields. Processes developed by the chemical, petroleum, nuclear and microbiology industries, for example, have been applied successfully to the upgrading of minerals.

Cost of research and developed processes must be considered, too. "Cost-price squeeze" is almost a hackneyed phrase in our industry today. So the new methods, when developed—and surely they will be—should be suitable for application of the automation principle.

Importance of this kind of research to the future of the aggregates industry is self-evident. Projected demands for high-quality construction materials are huge. Producers even now are worrying about reserves, particularly those close to construction projects, that can be upgraded to satisfy tough specifications that will get tougher. Zoning boards and high transportation costs are complicating the problem.

It's significant that industry and allied researchers know there's only one choice to make—more and better research as an applied science. It's underway. Drawing boards already are beginning to show some good possibilities.

"Threads of Gold" for a Roman Toga

The mineral *Chrysotile*, meaning golden fibers or threads, supplies over 90% of the world's asbestos requirements. Called the "miracle mineral" by the ancients, the Roman naturalist Pliny (23-79 A.D.) refers to the use of such materials as "a rare and costly cloth" used for the funeral garments of kings.

The secret of the great usefulness of asbestos lies in its unique combination of fibrous structure, fire and water resistance, flexibility and strength. Since the profitable recovery of asbestos fiber depends upon fine crushing without destroying fiber length, a crusher that will perform such functions economically and will produce large quantities of finely crushed material is essential.

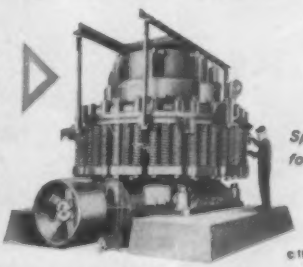
Proof of the world-wide acceptance of Symons® Cone Crushers in asbestos production is found in the field, where practically every major producer employs these high capacity, economical machines . . . *as in all of the great ore and industrial mineral operations the world over.*

SYMONS CONE CRUSHERS

. . . the machines that revolutionized crushing practice

. . . are built in Standard, Short Head and Intermediate types, in capacities to over 1500 tons per hour.

SYMONS . . . *a registered Nordberg trademark known throughout the world.*



Specify Non-Metallic NORDBAK® *for backing manganese crusher parts.*

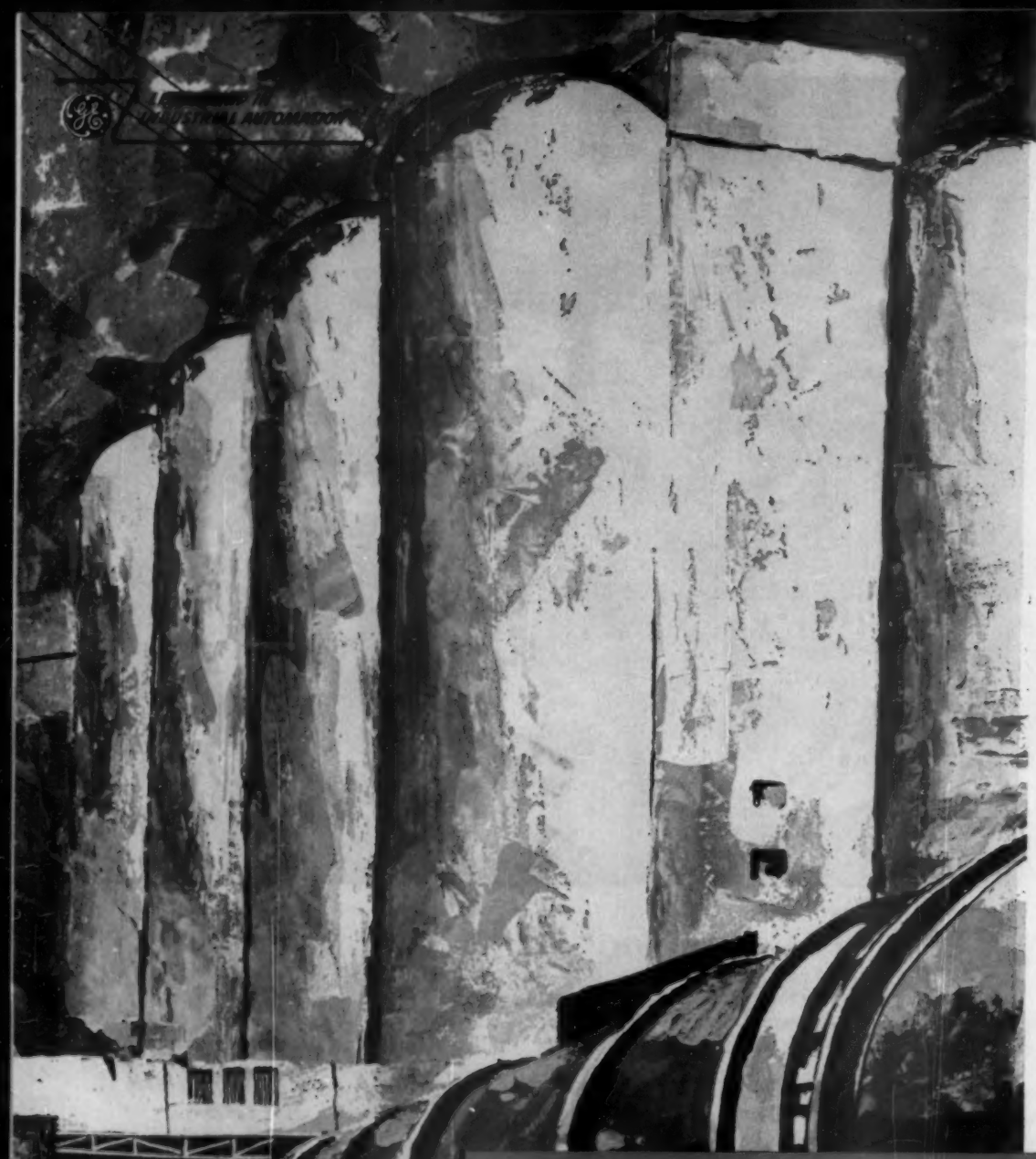
NORDBERG

MANUFACTURING COMPANY, Milwaukee 1, Wisconsin

©1961, N.M.CO. C461

ATLANTA · CLEVELAND · DALLAS · DULUTH · HOUSTON · KANSAS CITY · MINNEAPOLIS · NEW ORLEANS · NEW YORK · PHOENIX
ST. LOUIS · SAN FRANCISCO · TAMPA · WASHINGTON · WICHITA, KANS. · TORONTO · VANCOUVER · JOHANNESBURG · LONDON · MEXICO, D. F.

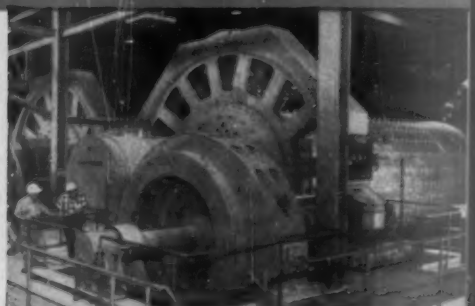
Enter 1210 on Reader Card



RESPONSIBILITY

G-E's responsibility as an electrical systems supplier eliminates multi-source supply problems, assures components are integrated for optimum performance.

EXPERIENCE



G-E's systems experience is based on years of association with the cement industry, assures the most efficient and reliable equipment for each installation.

5 Ways General Electric Helps You . . .

GET THE MOST OUT OF AUTOMATION

• **SINGLE SOURCE RESPONSIBILITY**—To realize the maximum benefits of an automated cement-making system, responsibility for the total electrical system should rest with one supplier. In this way you are assured that all components are completely integrated and coordinated for the most efficient and profitable system performance. General Electric, as a major supplier of components and systems for automation, provides this assurance.

• **SYSTEMS EXPERIENCE**—Through long association with the cement industry, General Electric engineers have gained a thorough knowledge and understanding of cement process control. Combining this experience with the latest automation know-how, they are fully aware of the total job to be done for the most economical and desirable results.

• **WIDEST PRODUCT SCOPE**—General Electric offers a large array of products to meet virtually every application need—from system-controlling computers to electrical drives, from specialized closed-circuit television systems to accurate x-ray chemical analyzers.

• **INTEGRATION**—General Electric is equipped to work directly with cement manufacturers, or to integrate activities with prime contractors, process engineers, or equipment builders to achieve the best end results for a given project.

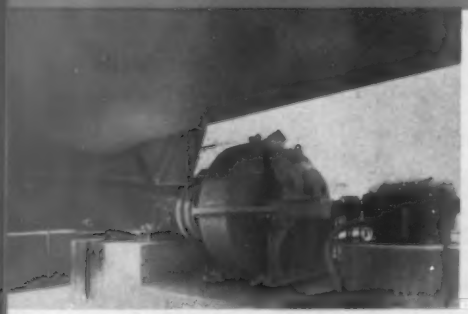
• **ADDED VALUES**—General Electric also provides the important extras—the added values that are essential for a continuing program of high productivity leading to increased profits. These extras include analytical and systems engineering, application engineering, and installation and service assistance—all oriented to help fill the automation needs and electrical equipment requirements of cement manufacturers.

Experience with cement producers has proven that these General Electric contributions result in definite cost savings. When you are thinking about automation, or the application of individual electrical system components for a new plant or plant expansion, think of General Electric—the most complete supplier of electrical equipment, systems, and services.

For detailed information, call your nearest General Electric Industrial Sales Office, or write for "A Guidebook to Automation for the Cement Industry," GEA-7179, General Electric Company, Section 658-26, Schenectady 5, N. Y.

GENERAL ELECTRIC

PRODUCTS



G-E's product scope helps meet virtually every application need—from dependable kiln drive systems to on-line x-ray chemical analyzers.

INTEGRATION

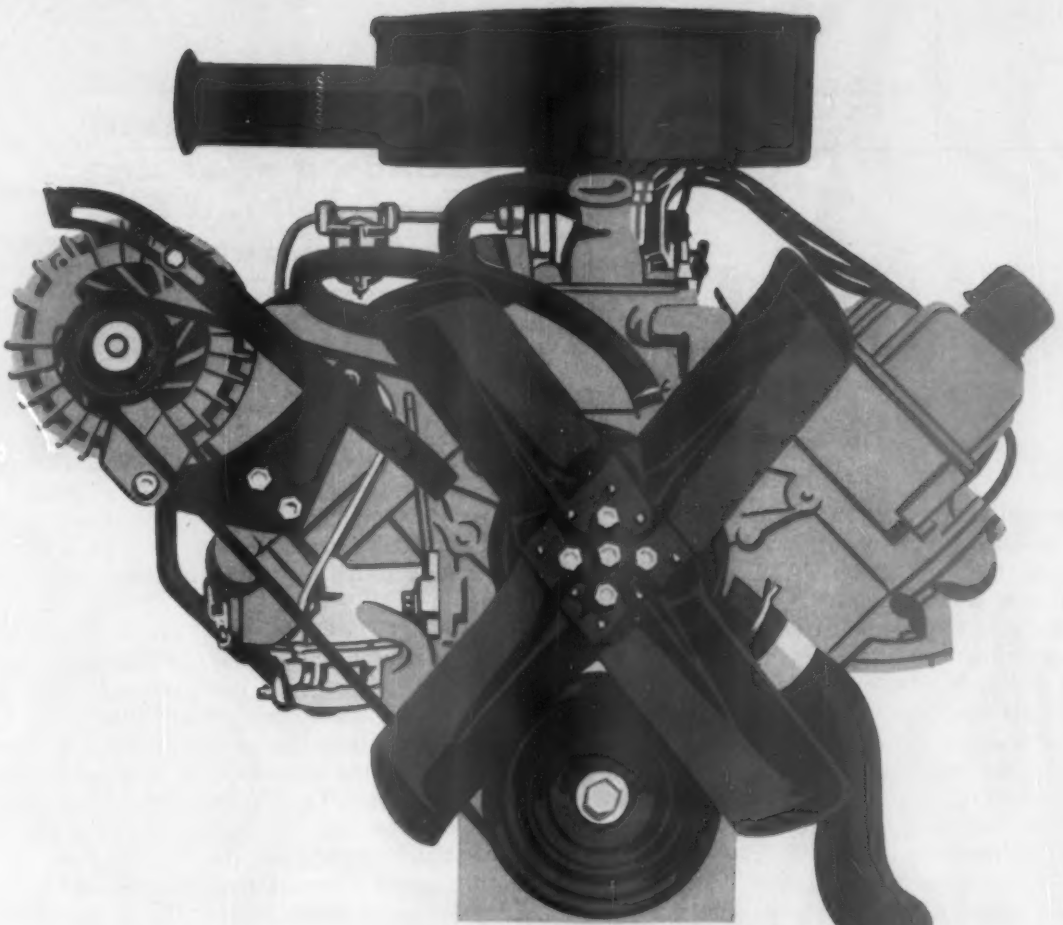
G-E's engineers work directly and effectively with cement manufacturers, contractors, process engineers or equipment builders to assure positive results.

ADDED VALUES

G-E's added values, such as comprehensive analytical engineering, assure optimum system performance.

"ALL 102 OF OUR '48 DODGES HAVE GONE AN AVERAGE OF 90,000 MILES EACH WITHOUT A PISTON OR A RING BEING REPLACED."

Capitol Dairy Co., Chicago, Illinois



"WE GET 125,000 TO 140,000 MILES FROM THE ENGINES IN OUR 8 DODGES BEFORE WE THINK OF REPLACING 'EM."

W. Hudman, Livestock Trucker, Lubbock, Tex.

DODGE TRUCKS FOR 1962 have more than 50 engineering advances that make them tougher, more tight-fisted than ever. Included are new 2-speed axles, heavier transmissions, more economical diesel power, and new distributors and starters. See and drive the 1962 Dodges—America's only Job-Rated trucks—at your Dodge dealer's.

Enter 1233 on Reader Card

ROCKY'S NOTES

by Nathan C. Rockwood

How much do we know about cement raw materials?

ONE WOULD NATURALLY THINK that research on any manufactured product would begin with research on the raw materials of which it is made. A new textbook on "Ceramics"* got us to thinking about this subject as it concerns the industries we are most interested in. So, how about portland cement? How much do manufacturers and their chemists know about their raw materials, or perhaps, better worded, how much do they think they should know? The latter question may be answered, more or less satisfactorily, by reference to the latest standard textbooks on the chemistry of portland cement.

Now, the manufacture of portland cement is technically a ceramic industry, as quoted from our author: "Ceramics may be defined as products made from nonmetallic inorganic materials, generally involving high temperatures in their manufacture." The oldest Greek and Sanskrit origin of the word means "substance developed with the aid of fire." Since art and science have been more specialized, it has not been customary to consider cement manufacture in the field of ceramics, yet that is where it still belongs. Ceramics, we all know, are concerned primarily with clays. Clay constitutes about two-thirds of the raw material used in the manufacture of portlnad cement.

How concerned are cement researchers and chemists with the clays they use? We find by reference to the latest edition of "The Chemistry of Cement and Concrete," by Lea and Desch (1956), that: "A great variety of limestones, marls and clays is used." The index contains but 10 brief references to clay—some of these merely to burnt-clay aggregates and pozzolans. For proportioning and use of raw materials, it seems to be accepted practice in the cement industry that all one needs to know is the chemical or mineralogical analyses for determining the proportions of the principal oxides of CaO, SiO_2, Al_2O_3, Fe_2O_3 and MgO. On the basis of empirical formulas, the raw mix is then calculated, and calcining in the kiln produces a clinker of which cement of various quality is produced.

In Bogue's "The Chemistry of Portland Cement" (1955), the treatment of clays is not much more detailed. In the index are only four references to clay. Three of these merely refer historically to the discovery that clay in limestones is what made possible the manufacture of hydraulic cements from them. The fourth refers to burnt-clay pozzolans. The only pertinent reference states: "Clay, shale and slate are of about the same composition, but of different geologic ages, and in different stages of consolidation." In his discussion of "Combination of Cement Components" in the kiln, Bogue does explain how the characteristics of the raw materials do affect the formation of the cement clinker. For example, he states (p. 223): "Application of unstable forms of crystals at the clinkering temperatures has not been consistently attacked, but could yield results of importance."

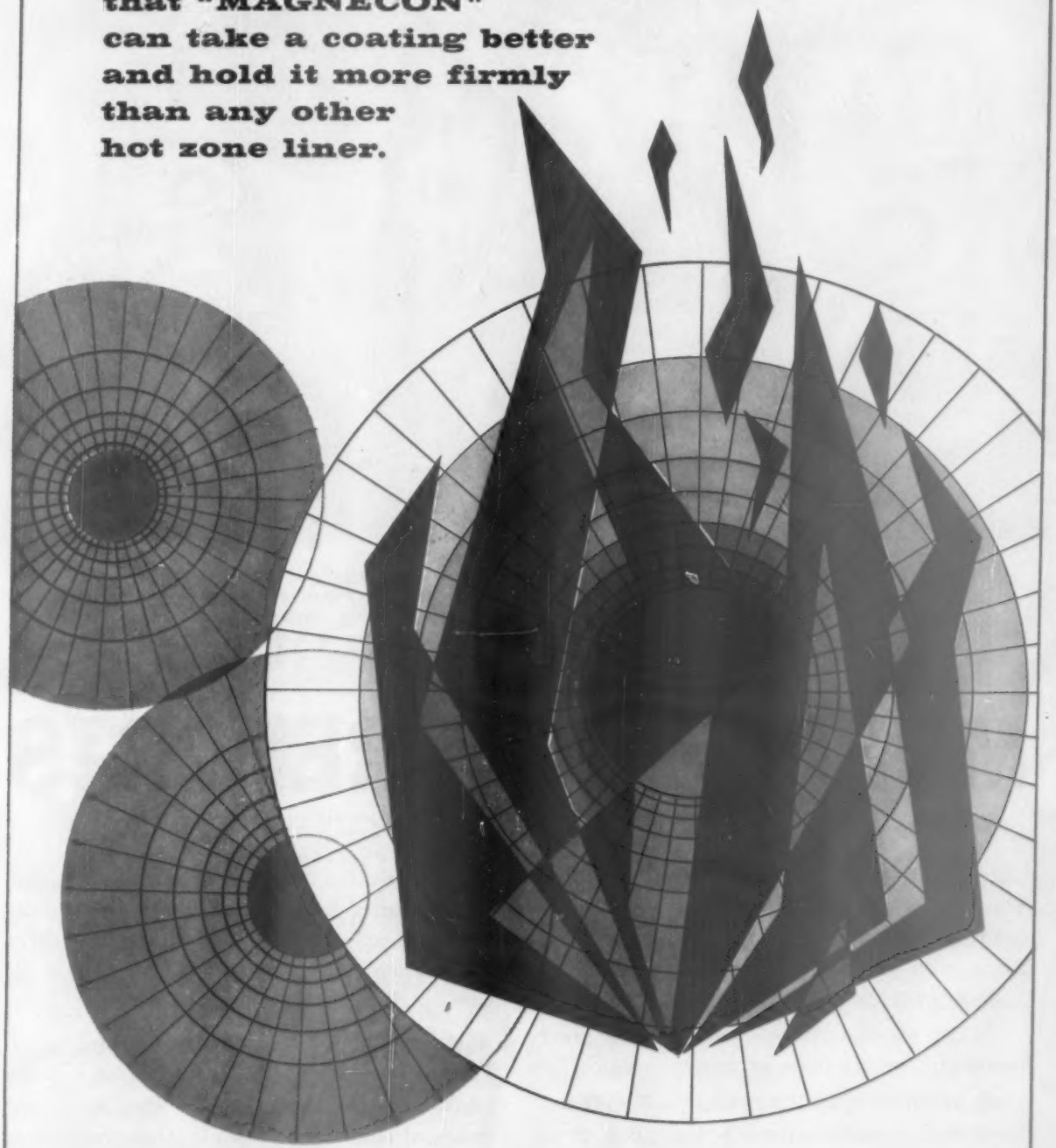
Now then, if we turn to our textbook on ceramics (and it is written with the layman in view as a reader) we find that a very intensive study has been made of clays, and that their characteristics are various and each characteristic has a use; ways have been found to change certain characteristics to advantage in the use of clays. For example typical properties of clays are given in a table which shows that water of plasticity varies from 26.5 percent for a flint clay to 47 percent for a Florida kaolin; the linear drying shrinkage from 3.5 percent for a brick clay to 8.5 percent for a Tennessee ball clay; modulus of rupture from 61 psi. for a South Carolina kaolin to 675 psi. for a Tennessee ball clay. These, of course, are merely physical characteristics but our author states, for ceramics, they are just as important as the chemical or mineralogical analyses.

For ceramic industries (that is, those covered

Please turn to page 118

**Ceramics*, by P. William Lee, Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y., Price $6.95*

It has been demonstrated repeatedly that "MAGNECON" can take a coating better and hold it more firmly than any other hot zone liner.



CANADIAN REFRACTORIES LIMITED

CANADA CEMENT BUILDING, MONTREAL, CANADA

2462

Enter 1207 on Reader Card

WERNER & SON, Clay Center, Nebraska. A Cat 966 with 4-yd. bucket feeds the 170-tons-per-hour blacktop plant and has plenty of time left to maintain the stockpiles. Operating ease and comfort play a big part in the 966 production. Ask operator Jim Jeffries. "Easy? I had to go back operating another machine the other day after running the 966. It's like running a Lincoln and then having to go back to a Model T. The power shift makes it easy and fast to operate on the job and the tight steering control makes it fast on the highway, too."

MORE OWNER-REPORTS

The sum total of most reports is this: Cat Wheel Loaders are setting new production records, lowering operating and maintenance costs, and letting operators finish a shift *without* being dead tired.

What are the reasons behind these good reports? Here are three of many:

Fast, powerful hydraulics. Time a Cat Wheel Loader's hydraulics—the lift, the quick drop. And watch it dig out of a bank. The speed and power come from a hydraulic system that has its pump driven *directly* from the engine; it's little affected by the load on the drive train. There's plenty of power available at all times and under all conditions.

Automatic bucket positioners. A third hand. Put the control lever in "lift" position and the bucket goes up automatically, then stops and holds at full height—while the operator is backing up and pulling up to truck or hopper.

WESTERN AGGREGATES, INC., La Canada, California, report their 944 with 2-yd. bucket averaged 3000 tons of material truck-loaded per eight-hour day over 40 weeks—plus stockpile maintenance. "It's more than just good production," they pointed out, "when you consider the low operating cost and no down time."

Fast cycles come easy for an operator on a Cat loader—exclusive automatic bucket controls, fast hydraulics and power shift transmission do it.

ON CAT LOADERS

After the load is dumped the lever is placed in "rack back" position and the automatic bucket positioner takes over again and tilts the bucket back to proper digging angle—and the operator is free to maneuver the loader.

Open deck design. The lift arms and cylinders are all up *forward*. Operators can push a Cat Wheel Loader hard, because they're not bothered by mechanisms raising and lowering beside them. They feel safer, more comfortable, more confident. They're safer getting on and off, too . . . easy steps from ground up to the big soft seat.

Try one of the three Cat Wheel Loaders on your job. Call your Caterpillar Dealer soon.

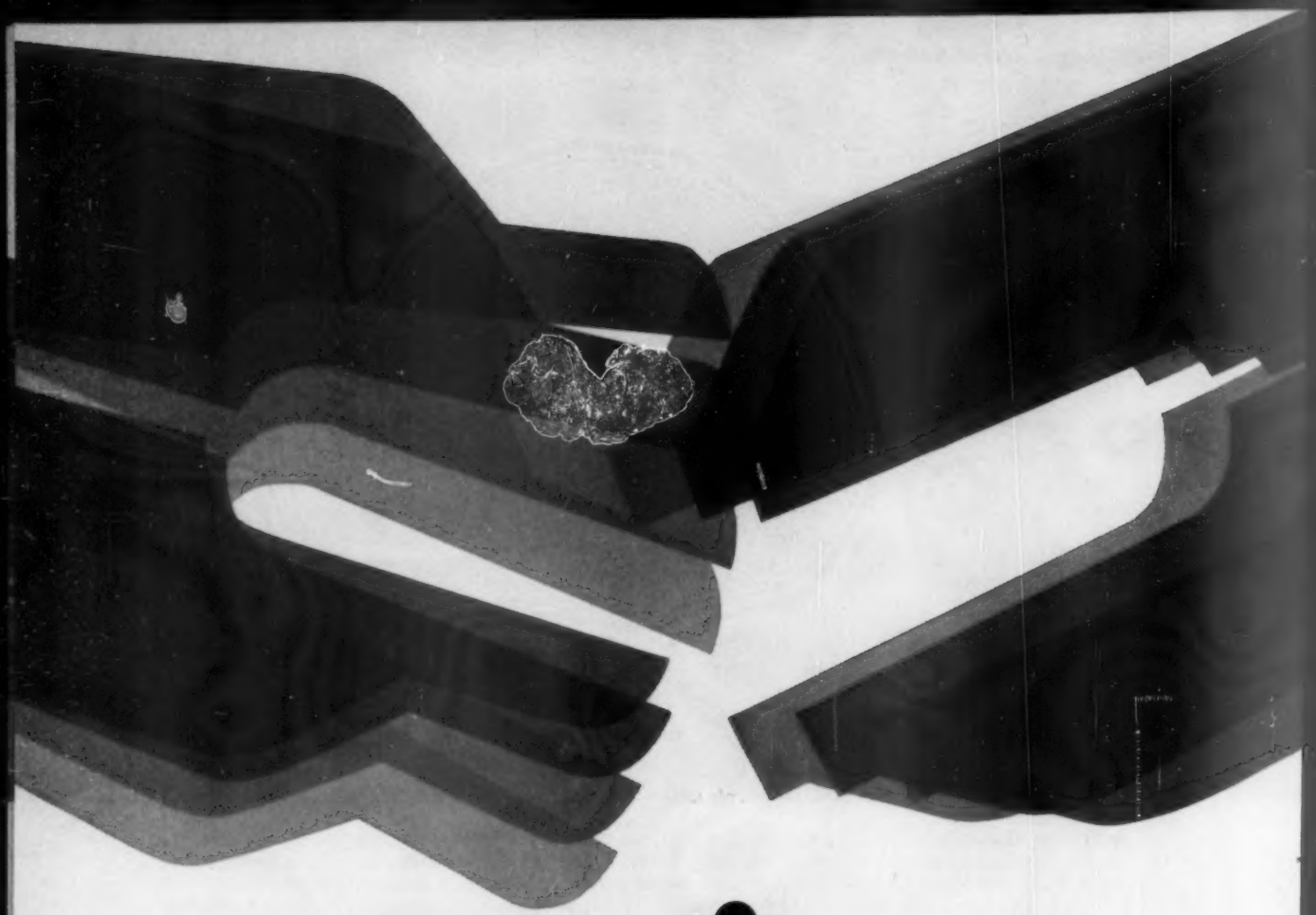
966—140 flywheel HP, 205 max. HP
944—105 flywheel HP, 135 max. HP
922—80 flywheel HP, 105 max. HP

Twenty buckets available from 1 yd. to 5 yd. including the Cat Side Dump Buckets.

CATERPILLAR

Caterpillar, Cat and Tractovator are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.



ADVANCED MATERIALS HANDLING

Sure way to help ease the profit squeeze—and KE is a master at it!

Kaiser Engineers designs and constructs a broad variety of major facilities for industry—steel plants, minerals recovery and processing installations, power generation plants, nuclear plants. In virtually every case, advanced, unique approaches to materials handling make possible greater efficiencies and profitability. KE has long made a specialty of exceptional materials handling, vital part of better plant design. A call from you will bring a specialist in your field to describe what Kaiser Engineers has done for others, can do for you.

KAISER ENGINEERS engineers-constructors Since 1914

Oakland, California—Chicago, New York, Pittsburgh, Washington, D.C., Accra, Buenos Aires, London, Montreal, New Delhi, Sydney, Vancouver, Zurich

7212

WASHINGTON LETTER

by Edgar Poe

Rock products Use to rise in Shelter program

The accelerated fallout shelter construction program means that a tremendous amount of rock products will be required for the next several years.

Congress provided a total of $207,600,000 for the program for the current fiscal year. Of this amount $169,300,000, or 83 percent, is earmarked for shelter survey and marking of existing structures, making improvements and establishing shelters in new and existing Federal Buildings.

Some funds go for food (day survival rations that have a five-year shelf life), water, tools, sanitation, medical and first aid, and research and development.

In addition to the $207,600,000, Congress provided $73,200,000 for the Department of Agriculture and the Department of Health, Education and Welfare to relocate Government-owned wheat supplies and for obtaining additional medical supplies.

A nationwide technical "census" of fallout shelter spaces in existing structures will be conducted by the Department of Defense. Congress on the recommendation of President Kennedy took the shelter program out of the jurisdiction of the Office of Civil Defense Mobilization and transferred it to the Pentagon under the direction of Secretary of Defense Robert S. McMamara. Contracting agencies are the Army Corps of Engineers and, where more convenient, the Navy Bureau of Yards and Docks.

As Congress set the stepped-up shelter program in motion a four-week crash training program for instructors to guide and supervise the contract surveys was inaugurated at the Army Engineer School at Fort Belvoir, Va. The first contingent of 120 instructors has graduated from the school.

Contracts will be awarded to qualified architect-engineer firms and self-employed engineers and consultants by 38 Army and 12 Navy district offices scattered throughout the United States. The field office (Army or Navy) for each state will coordinate the administration of all contracts for surveys within the state.

The Congressional report declared that specially designed underground shelters are much more effective against radiation than existing or adapted above ground shelters; group shelters are more effective for survival and recovery than individual family shelters.

"Data developed by the U. S. Naval Radiological Defense Laboratory justify the estimate that a carefully planned system of underground shelters, fully equipped and stocked with food and other essentials, can be provided on a nationwide basis at a cost ranging between $50 and $100 per person. Adopting even the higher figure and making some allowances for unanticipated costs, we have a cost estimate of $20 billion. A sum hardly one-half a given year's outlay for military defense purposes does not seem to us to be beyond economic reason or technical achievement."

Big concrete dam Slated in west

Plans to establish a field engineering office at Montrose, Colo., for the Morrow Point Dam and power plant to be constructed on the Gunnison River in Western Colorado are being made by the Bureau of Reclamation. Morrow Point Dam will be a 105-ft. high concrete-arch structure. Construction will start early in 1962. The Bureau of Reclamation says current studies indicate an installed generating capacity exceeding 40,000 kilowatts for the power plant. The damsite is 20 miles east of Montrose and 45 miles west of Gunnison.

Proposal for Unions under Anti-trust law

Sen. Strom Thurmond of South Carolina has received strong encouragement in connection with his bill that would make labor unions, like business and corporations, subject to the anti-trust laws. The measure goes over to the next session, which means it will be alive when Congress begins in January, the last session of the 87th Congress. Restraint of trade is destructive to the economic system regardless of who exercises it, said the South Carolinian. Exemption of labor unions is an inequity which should be corrected, he maintains.

Please turn page

Washington Letter

continued . . .

Cement plant To cost twelve Million dollars

International Finance Corporation and the Pakistan Industrial Credit and Investment Corporation Ltd. have given financial commitments of $4 million and $3 million, respectively, to the Ismail Cement Industries Ltd. for construction and operation of a portland cement plant near Gharibwal, West Pakistan. Ismail was organized in 1960 in anticipation of an increased demand for cement resulting from the major construction plans for the over-all development of the Indus Basin.

The new plant will have two kilns with a capacity of about 400,000 tons of cement a year. Construction will start upon completion of the financial arrangements and is expected to be completed in about two years. The Government of Pakistan has under construction rail and road links to the site of the factory. Total cost of the enterprise is estimated at U. S. $12,275,000.

Water jet Mining project

A major research project to determine whether coal in the state of Washington can be mined with powerful jets of water is underway as a joint venture of the Bureau of Mines and the Northern Pacific Railway Co. The agreement has been signed for conducting the experiments in the company's mine at Roslyn, Wash., about 70 miles east of Seattle. Hydraulic mining is sought as the answer to difficult problems in producing coal from "steeply pitching" beds encountered throughout the state.

Pollution control Program tightened by 1961 Congress

The Public Health Service is preparing for an expansion of the water pollution control program after Congress authorized $80,000,000 for the current fiscal year. The legislation that President Kennedy signed into law increases the authorization to $90,000,000 in 1963 and $100,000,000 for each of the four succeeding years.

The law-makers also increased the federal program to state and interstate water pollution control agencies from $3,000,000 to $5,000,000.

The 1961 amendments to the 1956 Federal water pollution control act are designed to speed up the anti-pollution activities in many streams. The legislation not only increases grants for building sewage treatment plants, but it calls for more research and stronger enforcement of anti-pollution laws.

The Public Health Service comes into the picture after state agencies make applications for grants for a particular community. To obtain approval of a grant, a city or town or area must convince PHS it is able to finance its share of the cost.

Federal grants totalling $232,500,000 were authorized by Congress for the five-year period ending June 30, 1961. An estimated 1,400 sewage treatment plants have been completed, 700 are under construction, and 500 are approved for early construction. The total cost of these plants is $1.3 billion.

Foster made Secondary Road chief

Appointment of Kenneth B. Foster as chief of the Secondary Roads Division of the bureau of Public Roads' Office of Engineering was announced by Federal Highway Administrator Rex M. Whitton. Affiliated with the BPR for 30 years, Foster has had extensive experience on federal aid secondary highway. His division is concerned with administration of the federal aid funds. Annual apportionments of federal funds for the secondary system has been about $260 million in recent years.

Federal land Surveyed For materials

The Interior Department may be directed by Congress to survey all government-owned land in a search for strategic materials. Sen. Lee Metcalf (D-Mont.), has recommended a 10-year program in a pending measure. The survey would cover all federally owned lands, including reserved lands and those subject to the mineral leasing and mining laws.

Your taxes are Going up again January first

On January 1, social security taxes are going up once again for the employer and employes. Furthermore, there will be additional increases in these taxes in 1963, 1966 and 1968.

The higher tax in January is required because Congress sweetened the social security benefits at the first session of the 87th Congress. Historically nearly all social security benefits are passed in election year, but 1961 was an exception. The tax rises in 1963, 1966 and 1968 will be necessary because of benefits provided by earlier amendments.

By 1968 the maximum tax will be $222 from each employe, plus an equal amount from an employer or a total of $444. It is apparent that social security is becoming both expensive and burdensome.

Enter 1211 on Reader Card

Latest score at Lehigh Portland Cement Co.
Production: 1,512,000 bbl. Pulverizer maintenance: $0.

Twenty-four hours a day, fourteen months in a row, a B&W pulverizer has been grinding it out for Lehigh Portland Cement Co., Alsen, N. Y.

During this time, the direct-fired 11½ x 400 ft. rotary kiln has produced 1,512,000 barrels of cement. The B&W pulverizer feeding the kiln ground and dried more than 30,000 tons of bitumious coal. In spite of this rugged duty, the pulverizer has required no maintenance.

Maintenance is low because of the wear resisting materials used. The rings are manufactured from B&W's exclusive Elverite C alloy. The balls are heat treated alloy steel.

Grinding elements maintain full contact throughout their lifetime, resulting in maximum fineness and greater production. The B&W pulverizer has helped Lehigh achieve an exceptionally low kiln coal rate.

The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

Babcock & Wilcox

No. 5 in a series of announcements on new **HOUGH** *machines*

This new 60-ton tractor is so different there is

nothing like it

in design, or in performance on push-loading and dozing work

For two years on several multi-million-yard earth-moving jobs a new idea in push-loading has been under extensive and sustained operation behind a variety of scrapers. This new idea is the HOUGH D-500 PAYDOZER — a different and better kind of rubber-tired pusher and dozer as shown by its performance on these projects.

More Power. A 700 hp turbo-charged V-12 Cummins diesel is governed to 2100 rpm and 600 hp for longer life and lower maintenance. Two newly-developed, high-efficiency dry-type air cleaners plus filtration of all oil circuits are provided.

Articulated Hydraulic Steering is one of the most unusual features and gives exceptional maneuverability. The turning radius is under 25-ft.—considerably less than its overall length and one-third less than a comparable unit with rear-steer. The rear wheels always track the front ones and always follow in the path cut. Combined with 30° rear-axle oscillation, this articulated steering keeps "all four feet" on the ground and also permits a twisting "walk-out" action in poor footing.

Wide-range Drawbar Horsepower. The power train includes a 3-stage, single phase, torque converter, a HOUGH-built full-power-shift transmission, power-transfer differentials in *both* axles and planetary hubs in all wheels. This drive train provides 80% of peak draw-bar horsepower over 75% of the entire speed range so it can push-load efficiently with a wider range of scraper sizes.

Three-way Blade and Push Block. Blade is 160" wide—extending 10" beyond the wheel path on each side, and has special reinforced center area for pushing. Six-way hydraulic control includes raise, lower, tilt to each side, forward and backward pitch. Modified wings help retain the load

while adjustable stabilizer shoes permit precise grade control. A separate pusher block is optional.

Unusual Stability and Smooth Riding are features the operator will notice and appreciate. These are achieved by the approved use of dry ballast material (100% heavier by volume than liquid) in all four tires. It lowers the center of gravity and also reduces the bouncing action usually found in unsprung machines. Standard tires are 33.5 x 33-26 PR, with options including 37.5 x 33. The 4-wheel brakes are air- controlled with dual pedals for operator convenience.

High Availability. One example of the many extra features in this unit to keep it profitably at work and reduce downtime is the separate fan-cooled oil-to-air cooler to effectively control transmission-converter oil temperatures. Full-shift fuel capacity is provided. An optional central lubrication system can be furnished that automatically lubricates 27 different points every 30 minutes of operation.

Your HOUGH Distributor is ready to show you why there is nothing like the D-500 PAYDOZER.

THE FRANK G. HOUGH CO. 12-8-1
705 Sunnyside Avenue, Libertyville, Ill.

Please furnish complete data on the D-500 PAYDOZER

Name
Title
Company
Street
City State

Enter 1246 on Reader Card

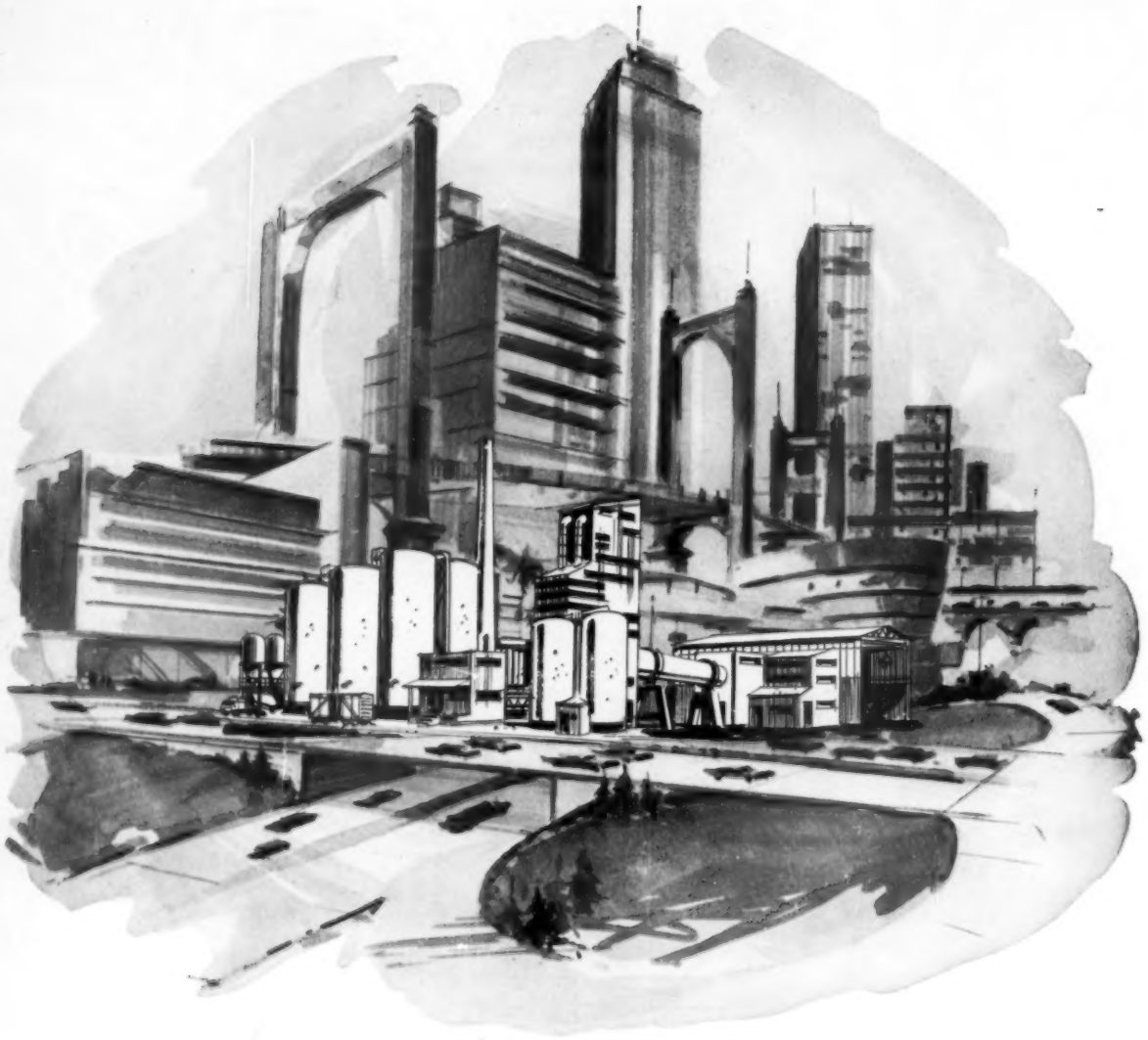
THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY - INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYDOZER, PAYMOVER, PAYLOGGER, PAYLOMATIC and PAY are registered trademark names of The Frank G. Hough Co.

HOUGH®

Enter 1246 on Reader Card

PAYDOZER®



Feeding the roots of progress in the cement industry

Cement—the matrix of world construction—is in the USA a 1.3 billion dollar industry. Continuing technological advances keep this basic industry efficient, competitive and responsive to changing requirements in building and construction. Fuller Company, whose pneumatic materials handling and process equipment figures in a wide range of industries, plays an important role here.

In more than 35 years of growing *with* the industry, Fuller has pioneered manufacturing innovations now standard in the field . . . techniques and equipment that have influenced vast improvements in the design of entire cement-producing plants. In these years Fuller has built an *integrated* organization—Dracco Division, Traylor Engineering & Manufacturing Division, Sutorbilt Corporation and Lehigh Fan and Blower Division. They are combined to provide the cement industry everywhere with advanced research, with the design and manufacture of equipment for crushing, grinding, preheating, burning, cooling, blending, heat transfer, conveying, dust collection and process control. Fuller is now able to undertake contracts for complete new plants for cement manufacturing and for the modernization of older ones.

Fuller is more than ever qualified today to help cement producers keep cement competitive in prices and quality with existing alternate materials and those to come. For more details on Fuller's capabilities, write today.

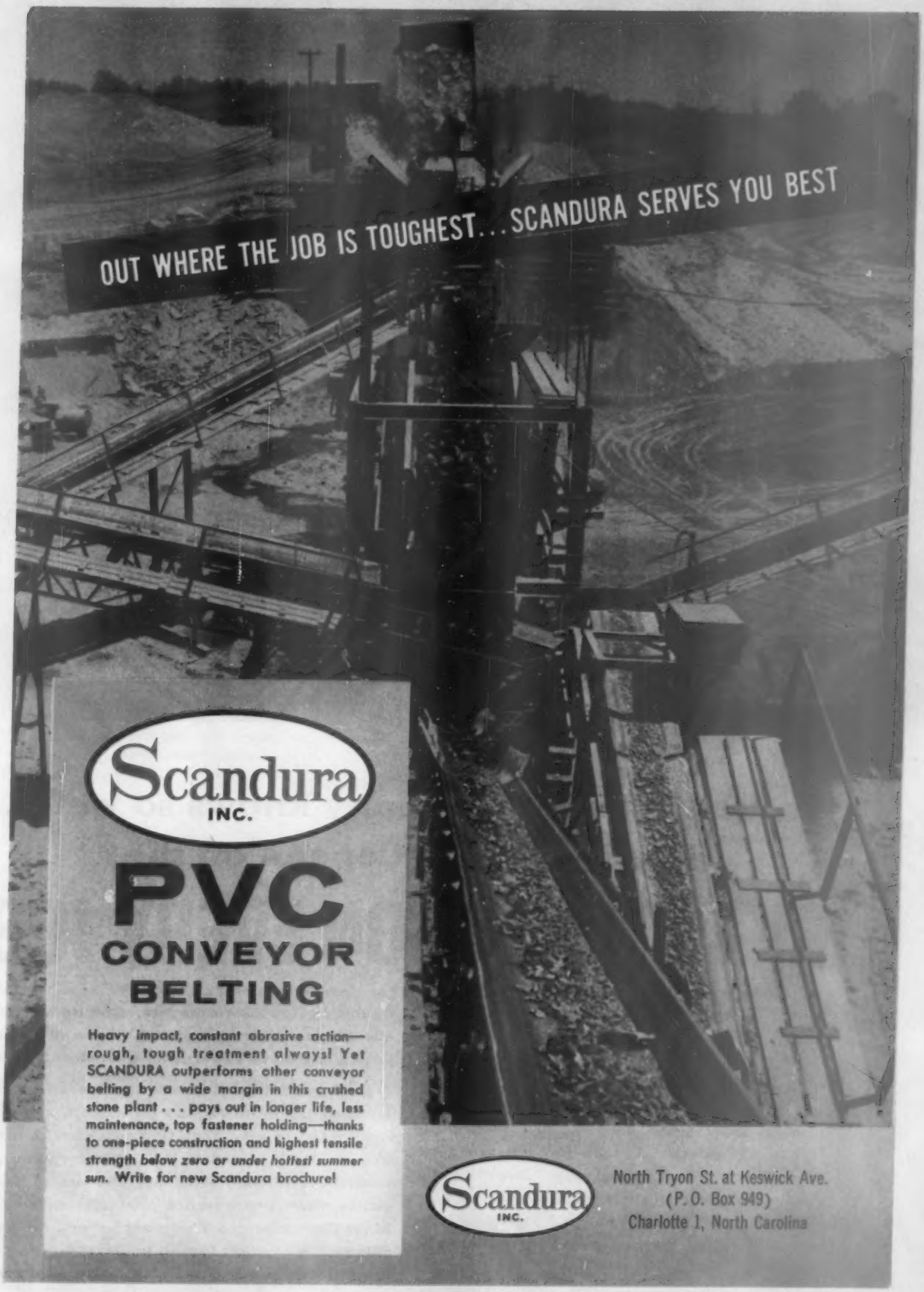
2880
G-245

See Pit & Quarry Handbook for details and specifications

Fuller

FULLER COMPANY • 102 BRIDGE ST. • CATASAUQUA, PA.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION • OFFICES IN PRINCIPAL CITIES
FULLER DIVISIONS.
Dracco • Lehigh Fan & Blower • Traylor Engineering & Manufacturing • Sutorbilt Corporation

Enter 1209 on Reader Card


OUT WHERE THE JOB IS TOUGHEST... SCANDURA SERVES YOU BEST
Scandura
INC.
PVC
CONVEYOR
BELTING
Heavy impact, constant abrasive action—rough, tough treatment always! Yet SCANDURA outperforms other conveyor belting by a wide margin in this crushed stone plant . . . pays out in longer life, less maintenance, top fastener holding—thanks to one-piece construction and highest tensile strength *below zero or under hottest summer sun.* Write for new Scandura brochure!
Scandura
INC.
North Tryon St. at Keswick Ave.
(P. O. Box 949)
Charlotte 1, North Carolina

Enter 1267 on Reader Card

As the Dolomite Company knows so well . . . hauling profits depend on the

RIGHT TRUCK ON EVERY JOB

Dolomite Products Co., Inc., Rochester, N. Y., avoids profit-squeezing hauling costs because it has the know-how and experience to analyze its truck needs with an eye to keeping costs under strict control. Loads, terrain, schedules, climate, speeds, etc., all must be carefully weighed in selecting trucks for best all-round performance. For twenty years, Dolomite has been developing the use of Mack trucks in a wide variety of assignments . . . keeping its large and diversified operation rolling smoothly, profitably.

In the quarrying phase of Dolomite's operation, for example, Mack B-813 Models, hauling double-bottom side-dumpers, team up with fast shovels to deliver four to five thousand tons of dolomite rock to the crusher each shift.

Modern efficient high-volume operations like those of Dolomite depend on modern efficient equipment to keep operating costs low. Macks, like the B-813's used in this quarry operation, contribute to high efficiency because of their outstanding performance characteristics. The Mack Turbocharged Thermodyne® engines provide plenty of power for fast get-aways under full loads. Massive self-equalizing brakes and easy, positive power steering assure safe, fast maneuverability at shovel and crusher. Traditional

UNDER THE SHOVEL—Fast cycle time with big loads is needed in quarry work. Dolomite puts big Mack double-bottom side dumpers on this assignment.

AT THE CRUSHER—Turbocharged Thermodyne diesel-powered Mack side-dumper empties quickly at the crusher as another big load pulls into position behind it. These units operate on only 20 gal. of fuel per 9 hr. shift.

FOR STOCKPILING—Crushed stone rolls to stockpile on Mack B-42T combinations. Manitou Construction Co., a division of Dolomite Products Co., Inc., also uses these vehicles to handle material for paving jobs.

Mack construction throughout reduces down-time and maintenance.

These are sound reasons why Macks are first choice where profitable operations rely on truck performance . . . why a Mack will pay for itself again and again by delivering top work capability per dollar invested. Your Mack representative is qualified by knowledge and experience to help you determine the Mack model that will provide the most economical solution to your trucking problem. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

8100

MACK
FIRST NAME FOR
TRUCKS

MACK
for over 4 straight years
NO. 1
by far in sales of diesel trucks

LABOR RELATIONS

A roundup of actual day-to-day in-plant problems and how they were handled by management men

How would you decide?

Can you fire a man for punching another's time card even if it was done without intent to cheat?

What Happened: At the end of a day's work, a long line of employes queued up to punch out. Four of the workers had a little arrangement of their own. Each would take a turn on the line—and punch the others out. This allowed the remaining three a few minutes head start to catch their buses or avoid backups in the parking lot.

When they were caught, they were promptly fired. At arbitration they admitted that they knew of the company rule against punching another's time card. But, they argued:

"Who was hurt! No one! We put in our full days and we never punched out for another when he left early or didn't show up. It was just a convenience."

Management contended that punching out another man's time card is among the most serious offenses in the industrial book. If exceptions were made it could lead to all kinds of abuses. And another thing, management pointed out, this was a pre-arranged affair, not a spontaneous or one-time violation. This amounted to a "plot."

Was the company:
Right? ☐ Wrong? ☐

What Arbitrator Maggs (chairman) ruled: "None of the employes was trying to 'steal time' from the company. Even though none of the men had an evil motive at the cost of harm to the company, their offenses would have been far more serious if the company had made certain things clear: (1) that it would not tolerate employes leaving the premises without punching their time cards; (2) it would not tolerate the punching of one employe's time card by another, or arrangements to have that done; (3) that it would apply this policy rigidly even when the employes involved had no evil motive, and (4) that its reason for maintaining this rigid policy was its belief that the experience of American industry has proved that only in this way can employers protect themselves against the few workers willing to 'steal work time' from their employer. Management had not made these things clear to its employes. Therefore, the company shall reinstate these employes with no loss of seniority."

Can management insist that grievances be settled one at a time?

What Happened: When a half dozen grievances reached the arbitration stage, the union suggested that one arbitrator be selected by both sides to decide the whole lot. Management balked. It gave these reasons:

1. When grievances are grouped together they don't get the full attention they merit.

2. When the union knows that it can stockpile grievances it will throw in lots of minor disputes which could best be settled at lower levels.

3. When an arbitrator gets several grievances to decide, there is a human tendency to "split up" the awards.

The union answered:

1. Why should the company complain? It gets half a dozen grievances settled for the price of one arbitrator. Everyone likes a bargain.

2. The company had previously allowed multiple grievances to be arbitrated.

3. There is nothing in the union contract which limits grievance settlement to "one at a time."

Was the union:
Right? ☐ Wrong? ☐

What Arbitrator Sembower ruled: "Because the company has made no proposal in past contract negotiations for a separation of grievances sent to arbitration, it has built up a custom and usage which this arbitrator is not prone to upset. It is the award of this arbitrator that all those grievances certified to arbitration within a 30-day period may be grouped into a single submission and heard by a single arbitrator." END

Enter 1243 on Reader Card

"4-in-1 actions do 'most any job... Fast and Efficiently"

Supt. Wm. Hagedorn, George L. Rack, Inc., Cincinnati, Ohio

George L. Rack, Inc., produces washed sand for masonry, asphalt plants, and fill—also supplies topsoil and playground clay to various markets. Their International Drott TD-20 Four-in-One strips raw materials; loads out both raw and finished materials; builds and maintains pit roads; cleans-up around the washing plant.

"Our 4-in-1 gives us a single rig with unlimited versatility," states William Hagedorn, Plant Superintendent. "Four-in-One bucket actions enable the operator to do 'most any job, fast and efficiently. After our six years of 4-in-1 experience, we wouldn't even consider the other type of bucket."

Prove what it means to get mine-and-quarry-proved **loader, 'dozer, clamshell,** and **"carry-type scraper"** actions—all in one big-capacity rig. See your International Drott Distributor for a 4-in-1 demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL®
DROTT®

Clearing out a build-up of mucky, clay-type washing plant waste for easy loading and removal—note how the Rack company's operator uses clam back-drag action, pulls down the material fast, to speed work that "stumps" non-clam buckets!

Sticky, mucky materials that plug "lockjawed" buckets, waste time and run up costs, don't slow down the 4-in-1. Reason: exclusive, positive self-cleanout bottom dumping. Opening the clam pulls the material from bucket surfaces—gravity downpull does the rest and keeps the cycle rhythmic!

For full-size, full-capacity bulldozer action, the operator simply "touch controls" the 4-in-1's front segment up—positions the blade segment—and rolls the earth like a specialized 'dozer!

PEOPLE IN THE NEWS

W. T. Ragland, Jr., named to board of Martin-Marietta

W. Trent Ragland, Jr., president of Superior Stone Co., Raleigh, N.C., has been elected a member of the board of Martin-Marietta Corp., which is a consolidation of the American-Marietta Co. and The Martin Co., Baltimore, Md. Superior Stone, with 26 crushed stone quarries in North Carolina, South Carolina, Virginia and Georgia, was founded in 1939, and became an operating division of American-Marietta in 1959. Mr. Ragland became a member of the A-M board in 1960. Born in Rowan County, N.C., Mr. Ragland attended the University of North Carolina where he was graduated with a BS degree in geology. He has been president of Superior Stone Co. since 1954.

Wounded in shotgun accident

Franklin P. Spratlen, Jr., president of Spratlen Materials, Inc., Spratlen Sand & Gravel Co., and Ready Mixed Concrete Co., Denver, Colo., was wounded in the left side recently when a 12-gauge shotgun accidentally discharged as he took it from a closet in his office for cleaning.

John Sweetland becomes American Cement secretary

John W. Sweetland has been elected secretary of American Cement Corp., Los Angeles, Calif., in addition to his duties as assistant to the president, J. P. Giles. A graduate of the University of Michigan, Mr. Sweetland was associated with Ann Arbor Construction Co. before joining Peerless Cement Co., Detroit, one of the operating companies of American Cement, in 1959. He was named to the executive staff in 1960.

Penn-Dixie names Glantz technical service director

Omar J. Glantz has been appointed director of technical services of Penn-Dixie Cement Corp., New York, N.Y. A graduate of the University of Denver with a BS degree in chemical engineering, Mr. Glantz formerly served as head of the cement unit of the U. S. Bureau of Reclamation. He joined Penn-Dixie in 1953 as plant engineer at Clinchfield, Ga., and a year later was named plant superintendent of plant No. 2. In 1955, he was made plant superintendent at Petoskey, Mich., and in 1957 became director of research at Penn-Dixie's central laboratory at Nazareth, Pa.

Marquette promotes Forbrich, Basler, Coombs and Moody

L. R. Forbrich (left), vice president of the Green Bag Cement Co., subsidiary of Marquette Cement Manufacturing Co., Chicago, Ill., has been promoted to the executive staff of the parent organization, to understudy Vice President Frank Moyle as director of the company's producing and distributing operations. The announcement was made recently by W. A. Wecker, president of Marquette.

Ralph R. Basler (right) has been promoted from superintendent of the Cape Girardeau, Mo., plant to assistant director of operations. A. J. Coombs, superintendent of the Nashville, Tenn., plant, succeeds Mr. Basler at Cape Girardeau, and J. W. Moody, who has served as production superintendent at Cape Girardeau, becomes superintendent at the Nashville plant.

Please turn to page 44

Enter 1244 on Reader Card

"Only Payhaulers dare move full loads down this 38% grade!"

Exclusive Torqmatic brake lets International Payhaulers speed full 27-ton loads down the mountain —a dangerous trip in any other rig. Early in the job, when this steep grade was too much for other haulers, six 95's kept production going. This is the toughest section of Slate, Hall & Hamilton's $8,000,000 roadbuilding contract.

Other rigs sit idle while "95" Payhauler units move 27-ton loads down mile-long haul road...

Slate, Hall & Hamilton of Portland are building 4-lane US Route 5 through Oregon's rugged coastal range. Contract calls for moving 4,800,000 cu. yds. of 20% rock material. Toughest part of the job is 330-ft. cut through high rocky outcrop above the Sacramento River. Existing Route 99 and main line of Southern Pacific Railroad—both kept open—run between the job and the river. Haul roads, crowded against the cliff, are steep and narrow, with hairpin curves.

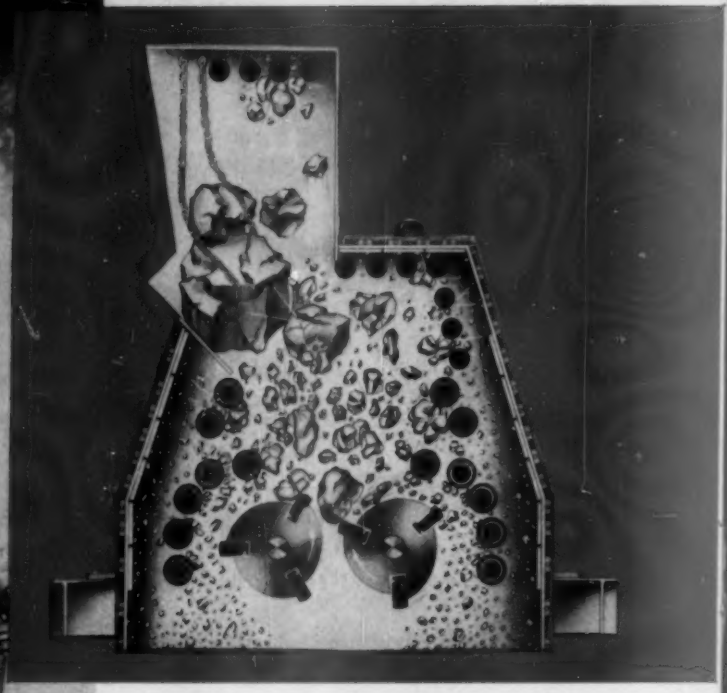
"I wish we had more Payhaulers on this hill," says Owner E. D. Slate. "They took out full loads on a mile-long road with a 38% grade where we didn't dare put other trucks. Even after we cut the maximum grade to 28% other rigs only carry half a load. Thanks to that Torqmatic brake, we're getting full production from the Payhaulers!"

Downgrade hauling stability is built right into the Payhauler. Positive Torqmatic braking, standard equipment on the 95, gives the operator confidence to use best haul speeds, even on the steepest grade with a full load. Fingertip power steering and convenient brake control lever further increase operator ease and safety—add up to extra haul cycles on every job. Prove to yourself how the 27-ton 95 or the 19-ton 65 will boost production on your spread. Call your International Construction Equipment Distributor and arrange for a Payhauler demonstration today!

International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

"We're really sold



OWNERS LIKE THESE CEDARAPIDS BENEFITS

Impellers rotate in opposite directions

Counter-rotating impellers direct rock upward and outward to utilize the entire breaking chamber for maximum production. With impellers rotating in opposite directions, there's no possibility of one impeller throwing rock into the other, putting a greater load on it and causing excessive wear on the impeller and hammers.

Breaks rock against rock

High angle of feed permits maximum penetration of rock into the hammer circle where it receives a square, sharp blow that hurls the rock back into the breaking chamber at terrific speed. With rock breaking against rock in suspension, there's 50% less contact of stone on metal. Manganese wear (and maintenance costs) are sharply reduced. Reduction ratios of 40 or 50 to 1 are common.

Versatile control of product size

Ricocheting rock is controlled in the breaking chamber by vertically adjustable breaker bars over the impellers until it is the proper size for discharge. By varying the impeller RPM (the faster the speed, the smaller the material) product size is further controlled. And only with *counter* rotation can the impellers be run at different speeds to blend materials.

True impact action

There's no pressure crushing because there's no wedging action in the lower crushing area. Wide discharge opening eliminates any scuffing or grinding which results in excessive fines as well as excessive wear and power consumption. It is Cedarapids' true impact action that upgrades the product to the desired cubical shape.

Produces highest quality aggregate

You'll meet toughest specifications for top quality aggregate with extremely low percentages of flat or elongated particles or soft stone. Six Double Impeller and two Single Impeller models meet every need.

on our whole Cedarapids plant–especially this

DOUBLE IMPELLER IMPACT BREAKER"

Charles and Pete Day, owners of Clarksville Stone Company in Clarksville, Tennessee, are new Cedarapids owners. They've used other equipment in the past, but now they have a 100% Cedarapids plant, they're completely sold on the benefits of Cedarapids engineering . . . especially their 3645 Double Impeller Impact Breaker.

Mr. Charles Day says, "It's been an education to see this machine work. We've never seen a unit that crushes stone as rapidly and easily as this Cedarapids Breaker. We're getting around 300 tons per hour and the stone is considerably smaller than we expected. I'd say 90% of the broken stone will pass 2" minus, which is very fine."

In addition to the Double Impeller, the Clarksville plant uses two 4033 hammermills and two horizontal vibrating screens, one 48" x 14' and the other 60" x 16'. For final gradation, the 16' screen has 7/8" cloth on the top deck, the second deck is for 5/16" chips, and the bottom deck is a 1/8" lime screen. "This Cedarapids plant will more than meet our needs or any needs we see in the near future," says Mr. Day. "We are really sold on the whole plant."

Clarksville Stone's plant was engineered from feeder to stockpile to meet the Day brothers' specific requirements for capacity, finished products, and low production costs. It will pay *you* to call on Cedarapids Stationary Plant Engineers to tailor a plant to *your* needs. Ask your Cedarapids Dealer for complete details.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

Cedarapids Built by IOWA

For jobs on the move **you'll get big primary capacity with a 3042 or 3645 Double Impeller Impact Breaker *on wheels*, with your choice of apron feeder, ground level feeder, single or double deck vibrating grizzly or a vibrating grizzly-feeder unit. For intermediate reduction, use a Portable 3026 or 4336 Single Impeller Impact Breaker.**

961N

Enter 1238 on Reader Card

People in the News

continued from page 40

Donald Muir named Riverside sales manager

Donald E. Muir, formerly vice president of operations for Arizona Sand & Rock Co., Phoenix, Ariz., has been appointed general sales manager for Riverside Cement Co., Los Angeles, Calif., a division of American Cement Corp. He replaces Walter W. Paisley, who has resigned to become director of sales for Marquette Cement Manufacturing Co., Chicago, Ill.

Mr. Muir served Riverside as director of public relations from 1951 to 1958 and as sales representative for Phoenix Cement Co. from 1958 to 1959. He later served as general manager of Acme Materials Co., Phoenix, and became vice president and then president when Acme changed its name to Phoenix Concrete Co., which was merged with Arizona Sand & Rock Co. January 1, 1961.

Victor Aubry appointed Houdaille vice president

Victor G. Aubry, Jr. has been appointed vice president and general manager of Houdaille Construction Materials, Inc., Morristown, N.J. He succeeds Col. Harry H. Haas (Ret.), who has resigned to become president and general manager of Duval-Wright Engineering Co., Jacksonville, Fla., a subsidiary of Houdaille Industries.

Mr. Aubry, a graduate of Rutgers University, joined Houdaille in 1954 as sales coordinator and became vice president for marketing. He is a member of the board of directors of Houdaille Construction Materials, a director of the Lehigh & New England Railroad Co. and Houdaille-Span, Inc. He is president of the New Jersey Crushed Stone Association and secretary-treasurer of the Highway Information Association of New Jersey.

Fred G. Lynn, who joined Houdaille 16 years ago, succeeds Mr. Aubry as general sales manager. He was formerly Bound Brook district sales manager and will be succeeded in this position by Elwood E. Sisson.

General Portland names new Houston plant manager

E. B. Thorn, Jr., has been appointed plant manager of the Houston, Texas, plant of General Portland Cement Co., Chicago, Ill. He was formerly plant manager of the Paulding, Ohio, plant, where he has served since the plant was built in 1955.

Paisley joins Marquette as director of sales

Walter W. Paisley has resigned as general sales manager of Riverside Cement Co. to become director of sales for Marquette Cement Manufacturing Co. and its subsidiaries, North American Cement Corp., New York, N.Y., Hawkeye-Marquette Cement Co., Des Moines, Iowa, and Green Bag Cement Co., Pittsburgh, Pa.

A native of Iowa and an engineering graduate of the New Mexico School of Mines, Mr. Paisley joined Riverside Cement Co. in 1946 and was appointed general sales manager in 1959.

In Memoriam

Walter B. Lenhart, consulting editor of ROCK PRODUCTS, died November 19 at the age of 71. Walter served ROCK PRODUCTS as associate editor and western editor for over 36 years, traveling from one end of the country to the other, gathering material for his articles on plant operation and processing. He studied mining engineering at South Dakota School of Mines, and had been active in chemical and metallurgical research in varied metallic and nonmetallic operations, as well as serving in a variety of responsible executive positions.

As a member of the editorial staff for many years, Walter was well known and admired in the industry that he knew so intimately. His articles on plant operations and processing have proved invaluable to producers in the rock products industry.

After his retirement in August of last year, Walter continued as consulting editor, his latest contribution being his series of articles on "Aggregates for Dams" currently appearing in ROCK PRODUCTS.

Throughout his editorial experience Walter was a loyal friend and advocate to all.

What Bower does to roller heads to give tapered bearings longer life

The spherical head design shown above is part of what we call "Spher-O-Hone". It simply means that Bower tapered roller bearings perform better, last longer.

Bower grinds roller heads with a spherical radius. This assures accurate roller alignment, which eliminates sliding and skewing. An "O" shaped groove is provided at the base of the cone flange for positive roller head lubrication. And the cone raceway and flange face are honed precisely. These further lessen friction, thus reducing wear.

This is typical of the attention paid to details in design and manufacture by Bower engineers. And to you this attention can mean faster schedules, less downtime and greater profit from each job because Bower bearings handle maximum capacity loads and last longer.

When you need tapered or straight roller bearings of any type or size, be sure to specify Bower.

BOWER ROLLER BEARINGS

FEDERAL-MOGUL SERVICE

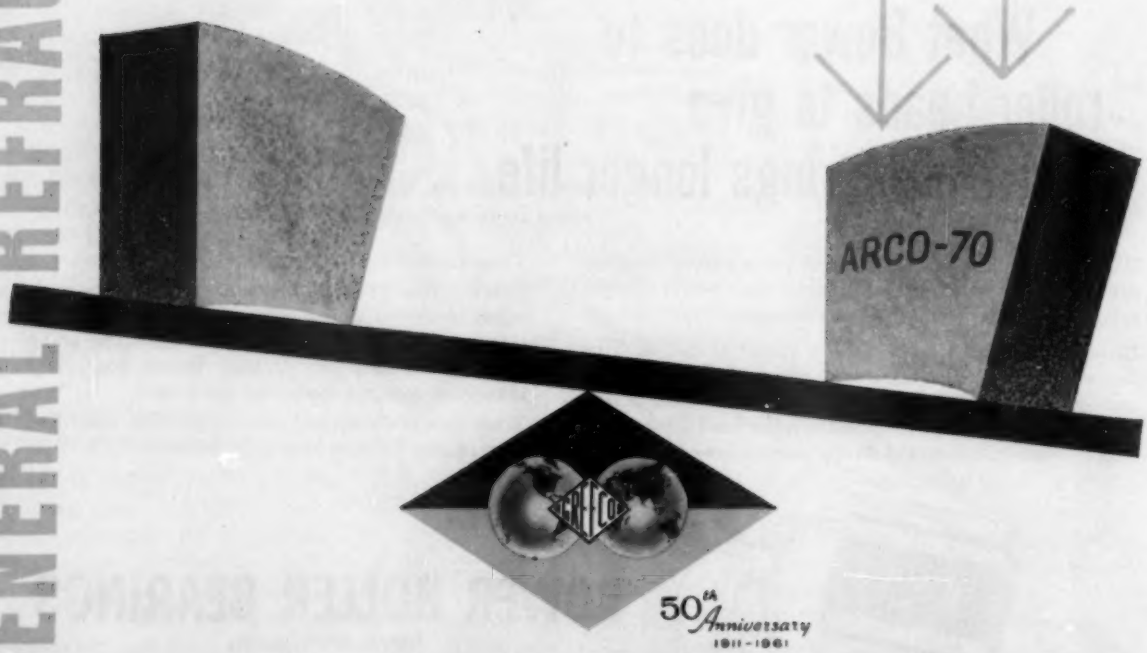
DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICH.

Enter 1208 on Reader Card

NEW! GREFCO HIGH-DENSITY ARCO-70 KILN LINERS

Kiln operators demanded it. GREFCO research developed it. It's GREFCO'S new high-density ARCO-70 brick—more pounds of tougher, harder working, longer lasting ARCO-70 condensed into standard brick shapes and rotary kiln liners. ◆ On the-job tests have proven outstanding service, plus increased ability to withstand severe operating conditions. These tests prove conclusively that new ARCO-70 is the highest standard of 70% alumina brick quality in its field. ◆ New ARCO-70 is produced under GREFCO quality control, insuring identical cost-cutting performance from every ARCO-70 brick. ◆ To put new ARCO-70 to work for you call your GREFCO representative, or write—GENERAL REFRACTORIES COMPANY, General Offices: 1520 Locust Street, Philadelphia 2, Pa. • District Sales Offices in All Principal Cities

GENERAL REFRACTORIES



Enter 1232 on Reader Card

Now's the time for Euclid training

Students concentrate on "lab" work

For the past fifteen years, thousands of service men have been learning the ABC's of preventive maintenance from Euclid Div. of General Motors Corp. They come from all over the world, too, to benefit from the year 'round classes at Euclid's fine new Hudson, Ohio, plant.

Emphasis is primarily practical throughout the numerous courses scheduled on scrapers, rear dumps and crawlers. From November through April, dealer and customer personnel have the opportunity to receive much the same training—and from the same instructor staff—at several of the General Motors Training Centers located throughout the country. A full complement of components, models, filmstrips and 16mm movies is available.

Field schools, in which especially close attention is paid to daily maintenance, are also held. This well-established and comprehensive program is headed by J. P. Neppel, supervisor of service training.

Snow white marble comes from Bloody Basin

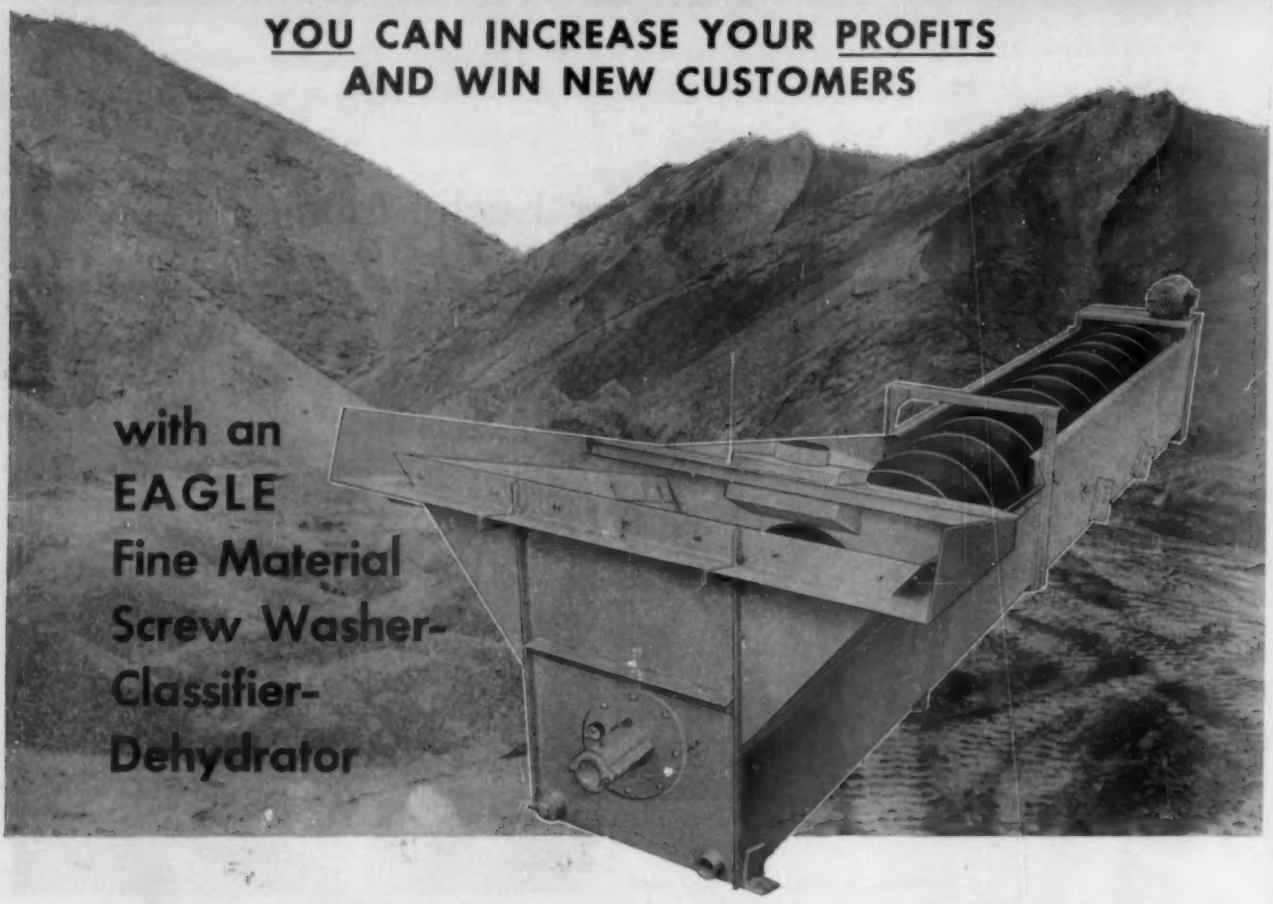
A million-ton deposit in the Bloody Basin of Tonto National Forest, 50 miles north of Phoenix, Ariz., is providing exceptionally tough, pure, snowy marble for a new company, Arizona Natural Rock Co. Roofers, terrazzo manufacturers and swimming pool contractors are finding that the marble granules are highly weather-resistant and possess excellent insulating and reflecting qualities. Tests indicate a Mohs scale hardness of 5.5 and a calcium carbonate percentage of 97.8.

Eventually the company plans to market roofing granules throughout Arizona, New Mexico, Nevada and southern California. Future products may include dimensional building blocks and ornamental slabs and sheets.

Please turn to page 50

MAKE MORE PROFIT FROM

YOU CAN INCREASE YOUR PROFITS AND WIN NEW CUSTOMERS



It only costs a few cents a ton to process sand in an Eagle Screw Unit—*sand that will then meet many specifications*—sand that will give you a better return than sale of pit run material or sand that has been screened only.

The Eagle Fine Material Screw Unit washes material clean. Classifies the sand into various gradations by controlled wasting or retention of fines. Discharges it properly dewatered for conveyor stockpiling.

The Eagle cannot create sand that does not exist, but *if you have the sand, an Eagle will upgrade it, increase its market value for you—and do it economically.* This equipment has also proven to be the most economical method of dewatering waste sands for stockpiling rather than cleaning out settling ponds with a bulldozer or dragline.

Single and double screw units. Easy to operate—require little attention. Occupy minimum of space. Easy to set in at any existing plant. Have features that insure profits and reduce maintenance costs—get the whole story—send for Catalog 61.

SINCE 1872
EIW
EAGLE IRON WORKS

Factory-Trained Distributors Everywhere!

EAGLE IRON WORKS

ENGINEERS • MANUFACTURERS

137 HOLCOMB AVE., DES MOINES, IOWA

YOUR SAND!

Supercrete, Ltd., Fort William, Ontario, uses this 54" x 34' Eagle Double Screw Washer to process sand for ready-mix. The Manitoba plant also uses an Eagle.

Jamacha Sand Plant, El Cajon, Calif., uses two Eagle Single Screw Units, each producing a different sand gradation. The screw at left is a recent addition.

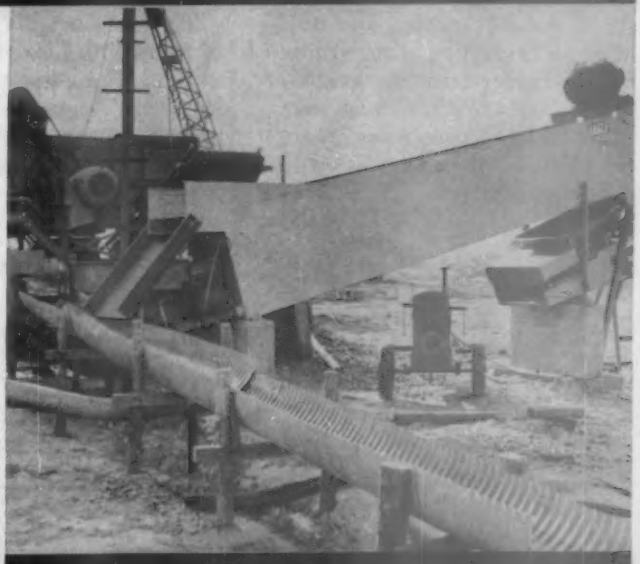
Lime City Stone Co., Lime City, Ohio, processes fine aggregate for concrete with an Eagle 24" x 25' Washer. A Water Scalping-Classifying Tank can always be added.

Eau Claire Sand & Gravel Co., Wis., processes sand for various purposes with this Eagle 30" x 25' Single Screw Unit. Some prefer Eagle Portable Washers.

Wash your coarse aggregate with an Eagle Coarse Material Washer-Dewaterer!

The combination of paddles and screw flights in the Eagle Coarse Material Washer provides thorough scouring of crushed stone or gravel up to 2—2½" diameter in size. Material discharged sparkling clean —35 to 350 tons per hour, depending upon size of Single or Double Screw Unit used. Special attachments are available for removal of trash, shale, coal, lignite and other deleterious material.

Send a 10 lb. sample of your material for a free test in our laboratory and complete report. No obligation. Write for shipping instructions.

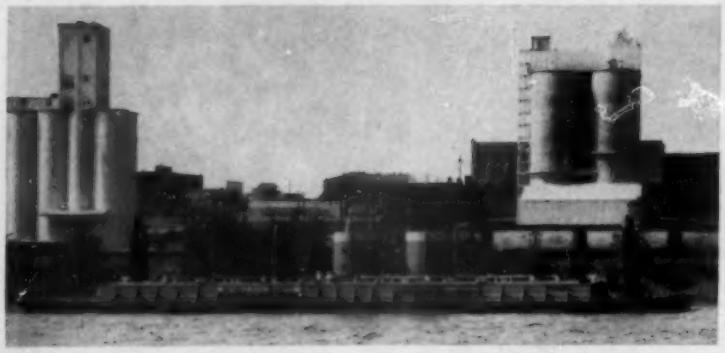


This Eagle Coarse Material Washer-Dewater is doing an excellent job for Memphis Stone & Gravel Co., Memphis, Tenn. All washers available on wheels.

Enter 1217 on Reader Card

Industry News

continued from page 47



Universal Atlas "Hannabelle" totes cement down Mississippi

More efficient distribution throughout the St. Louis area, southeastern Missouri and southern Illinois is now available from Universal Atlas Cement's brand new distribution station in St. Louis. The 50,000-bbl. station is supplied from the company's Hannibal, Mo., plant—site of the first cement plant west of the Mississippi—by the "Hannabelle," a specially-designed 640-ton barge.

One man can control the entire unloading operation from an electrical control center amidship. The bulk cement is moved by compressed air pumps on the barge through a pipe running under terminal railroad tracks to the top of the storage silos, where it is sent to any of seven bins. Universal Atlas engineers designed the 12,000-bbl. capacity barge, and it was constructed by American Bridge Div., U. S. Steel Corp.

"THE PRESENT WITH A FUTURE"

Slag plants celebrate top safety year out of twelve in annual competition

The best injury experience in the 12-year history of the safety competition sponsored by the National Slag Association and conducted by the U. S. Bureau of Mines was reported in 1960. The 49 competing plants turned in an injury-frequency rate of 8.042 per million man-hours, which was 35 percent below that of 1959 and 48 percent below the 12-year average. The average severity rate was 451.288 days per million man-hours—85 percent below last year's figure and 89 percent below the 12-year average. All in all, 3,232,972 man-hours were worked during 1960.

The Lackawanna No. 2 plant of Buffalo Slag Co., Inc., at Lackawanna, N.Y., was the winner in the Class A group of plants operated 60,000 man-hours or more. It had no disabling injuries in 133,995 man-hours. Thirteen other plants in this category also celebrated an injury-free 1960.

Class B plants—operated less than 60,000 man-hours—were headed by the Middletown (Ohio) plant of American Materials Corp. The winner, in its first year of competition, chalked up 51,605 man-hours without injury. Fourteen additional operations reported no injuries with a smaller number of man-hours.

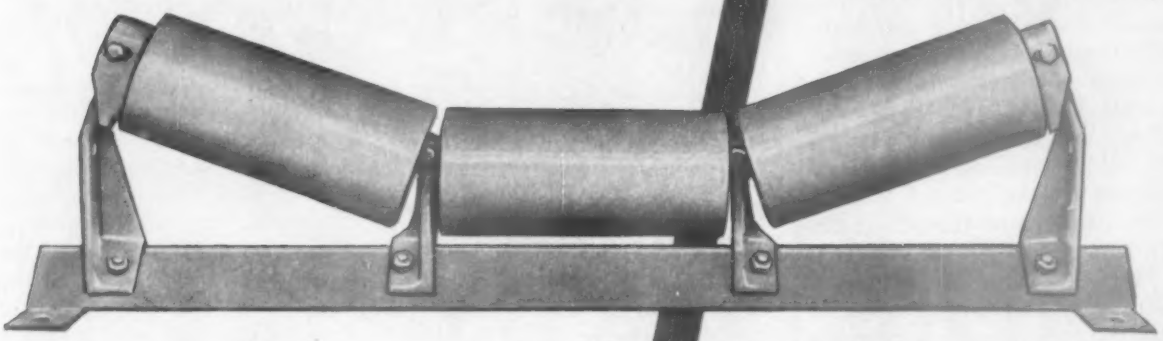
Please turn to page 52

Injury data for slag plants enrolled in the National Slag Association Safety Competition, 1949-60

			Injuries					Days of disability					Frequency rate[1]	Severity rate[1]
Year	Plants	Man-hours	Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1949	40	2,756,615	2	—	2	66	70	12,000	—	450	1,429	13,879	25.393	5.035
1950	39	2,943,489	—	—	2	55	57	—	—	1,463	1,593	3,056	19.365	1.038
1951	45	3,516,764	1	—	3	66	70	6,000	—	600	2,577	9,177	19.905	2.610
1952	46	3,256,559	5	—	1	63	69	30,000	—	375	2,637	33,012	21.188	10.137
1953	45	3,077,684	2	—	2	42	46	12,000	—	900	1,031	13,931	14.946	4.526
1954	49	3,094,449	3	—	—	40	43	18,000	—	—	1,284	19,284	13.896	6.232
1955	49	3,600,374	2	—	2	43	47	12,000	—	2,081	1,253	15,334	13.054	4.259
1956	47	3,504,811	1	2	4	48	55	6,000	12,000	4,735	1,639	24,374	15.693	6.954
1957[2]	46	3,266,305	1	—	2	24	27	6,000	—	415	1,194	7,609	8.266	2,329.544
1958	48	3,131,043	1	—	3	39	43	6,000	—	5,000	1,409	12,409	13.733	3,963.216
1959	49	2,412,859	1	—	1	28	30	6,000	—	300	1,085	7,385	12.433	3,060.684
1960	49	3,232,972	—	—	1	25	26	—	—	400	1,059	1,459	8.042	451.288
Total	—	37,793,924	19	2	23	539	583	114,000	12,000	16,719	18,190	160,909	15.426	4.257.536

[1]Frequency rate indicates the number of fatal, permanent, and other disabling work injuries per million man-hours of exposure; severity rate indicates the number of days of disability from injuries per thousand man-hours.
[2]Beginning with 1957, severity rates are based on million man-hours.

There's NO BETTER TIME to overhaul your conveyor system



NOW, when work is beginning to slack off, is the time to overhaul, replace and repair your conveyor system.

NOW, before it's too late and you get caught in a spring rush.

NOW, when parts are on your dealer's shelves and you don't have to wait as much as a few days for delivery.

Your CEDARAPIDS dealer has a full line of conveyor system parts for immediate delivery including:

1. Heavy duty troughing rolls (shown above) with Life-Seal bearings that don't clog up and never need lubrication.

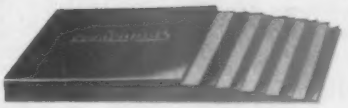
2. Head pulleys with Safety Grip Lagging to reduce slippage and increase traction.

3. Return rolls of heavy gauge seamless steel tubing with crimped ends that won't damage the belt.

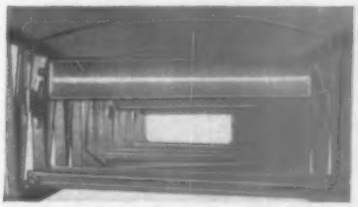
4. Head end belt wipers to clean the conveyor belt and prevent material build-up on return rolls.

5. Conveyor belting and fasteners specially designed for rugged work.

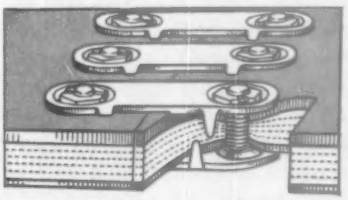
These are just a few of the many items available for conveyor system overhaul and repair. Bulletin CON-2 describes the full line and a copy is yours for the asking.



BELTING

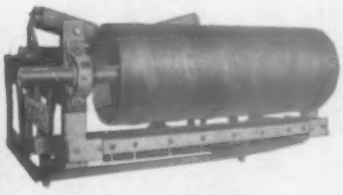


RETURN ROLLS



FASTENERS

HEAD PULLEY



BELT WIPERS

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa

Cedarapids
Built by IOWA

P-2061-H

Enter 1223 on Reader Card

Industry News

continued from page 50

Nigeria proud of new portland cement plant

A $4 million cement plant, in the planning since 1955, has been called the largest single manufacturing undertaking ever established at one time in Nigeria. Located at Ewekboro, West African Portland Cement Co. Ltd. is turning out portland cement at the rate of 200,000 tpy., using an oil-fueled kiln 200 ft. long and 12 ft. 6 in. diam.

Over 13,000 different items of equipment and machinery had to be imported in order to complete the plant. Nigerian personnel were trained in the United Kingdom by The Associated Portland Cement Manufacturers Ltd., which has supplied Nigeria with cement for over 70 years and remains as technical partner of West African. In time, all plant positions will be filled by Nigerian workers, who have incidentally been provided with both medical and recreational facilities by the company.

Flintkote projects underway both here and in Canada

Gypsum deposits containing reserves of at least 45 million tons are being developed by Flintkote Co. at Flat Bay, Newfoundland, under a 99-year renewable lease. The McNamara Construction Co. of Newfoundland, Ltd., St. Johns, is responsible for completion of a 6-mile aerial conveyor from the Flat Bay quarries to pier facilities at Turf Point, and a crushing system at Flat Bay.

Camden, N.J., is the site for Flintkote's new gypsum-processing plant, expected to be completed by October 1962. The 25-acre site, which includes an 18,000 sq. ft. office building, deep-water loading facility and railroad sidings, was purchased from the Public Service Co. of New Jersey and was formerly the plant of Camden Coke Co. The new plant will process over 165,000 tpy. from the Newfoundland reserves.

Sand and gravel plants make their annual reports to the Bureau of Mines

The U. S. Bureau of Mines has issued the results of its 1960 safety competition for sand and gravel plants. Of the 188 plants enrolling, 107 reported an injury-free year. Collectively they worked 8.7 million man-hours, had an over-all injury-frequency rate of 23.6 disabling work injuries per million man-hours of exposure to hazards and had an injury-severity rate of 4,632.6 man-days charged per million man-hours.

Although over half the plants reported no disabling injuries, the total safety record was less favorable than in preceding years. The frequency rate was the fourth highest and the severity rate the highest in the history of the competition.

Seventy-five percent of all injuries reported were attributed to handling objects, falls of persons, machinery, haulage, falling objects and bumping objects. The severest injuries, causing 97.7 percent of all man-days lost, were due to machinery, haulage, falls of persons, handling objects and hot substances—in that order.

Plants were divided into two groups for judging. Winner of the bank or pit group was the Fred plant of Southwest Construction Materials Co., Grand Prairie, Texas. It has worked 163,428 man-hours without a disabling injury, and ranked second in the 1959 competition. The dredge group was won by the Kinder plant of Gifford-Hill & Co., Inc., Kinder, La. Working 140,250 man-hours without a disabling injury, it has been a competitor since 1953 and was winner in 1958. The five states contributing the greatest number of plants were: Texas—30; California—23; Ohio—19; Indiana—15, and Illinois—11.

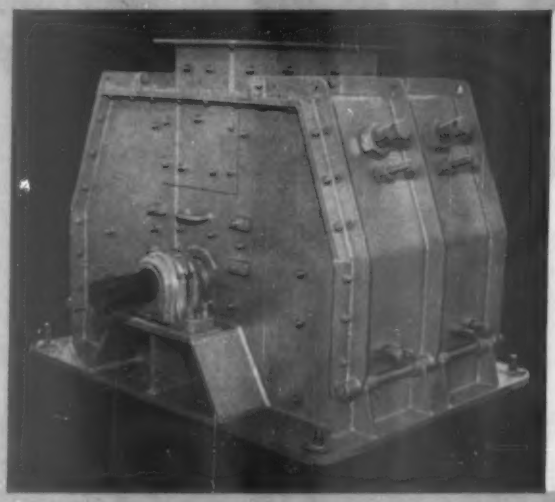
Please turn to page 56

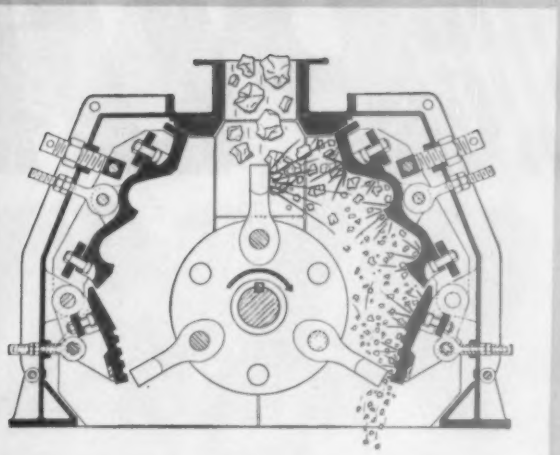
Injury experience of all sand and gravel plants enrolled in National Sand and Gravel Safety Competition, 1950-60

Year	Plants	Man-hours	Injuries					Days of disability					Frequency rate[1]	Severity rate[1]
			Fatal	P.T.	P.P.	Temp.	Total	Fatal	P.T.	P.P.	Temp.	Total		
1950	192	10,172,520	1	—	9	239	249	6,000	—	9,450	5,067	20,517	24.478	2,016.904
1951	166	10,827,501	1	—	9	267	277	6,000	—	12,919	6,433	25,352	25.583	2,341.445
1952	157	10,568,259	1	—	11	257	269	6,000	—	8,884	5,006	19,890	25.454	1,882.051
1953	165	12,293,315	6	—	4	259	269	36,000	—	675	4,953	41,628	21.882	3,386.231
1954	172	10,851,954	3	—	13	225	241	18,000	—	11,376	5,116	34,492	22.208	3,178.414
1955	161	9,661,293	2	1	6	210	219	12,000	6,000	6,775	4,388	29,163	22.668	3,018.540
1956	154	9,646,969	4	—	8	188	200	24,000	—	8,540	4,268	36,808	20.732	3,815.499
1957	208	11,393,331	4	—	18	205	227	24,000	—	15,792	4,540	44,332	19.924	3,891.048
1958	174	8,825,450	1	—	4	155	160	6,000	—	4,935	4,352	15,287	18.129	1,732.150
1959	173	9,243,501	1	—	3	191	195	6,000	—	600	4,784	11,384	21.096	1,231.568
1960	188	8,675,838	4	—	8	193	205	24,000	—	11,295	4,897	40,192	23.629	4,632.636
Total	—	112,159,931	28	1	93	2,389	2,511	168,000	6,000	91,241	53,804	319,045	22.388	2,844.554

[1]Frequency rate indicates the number of fatal, permanent, and other disabling work injuries per million man-hours of exposure; severity rate indicates the number of days of disability from injuries per million man-hours.

"DOUBLE IMPACT" ACTION of Pennsylvania Fine Reduction Reversible Impactors gives better product at lower costs... for producers of fine cubical aggregate or manufactured stone sand





● Pennsylvania 7-38 Fine Reduction Reversible Impactor. Note "double impact" action in cross-section drawing.

Because of "double impact" action —in which stone is crushed by repeated impact back-and-forth between hammers and breaker blocks —Pennsylvania Fine Reduction Reversible Impactors can produce for you a well-graded, fine cubical product . . . at *profit-making costs.*

Note, also, these other unique cost-saving features:

ADJUSTABLE BREAKER BLOCKS—Both upper and lower breaker blocks are adjustable. Permits maximum control of circulating load and product gradation.

LESS WEAR—Longer life for hammers and breaker blocks built of cast alloy steel. Side liners, heat-treated carbon steel.

EASY ACCESSIBILITY—Entire breaker block assembly swings back, exposing rotor assembly for quick inspection.

IDENTICAL REDUCTION—Position of breaker plates and feed chute results in identical reduction when crusher is run in either direction.

LOWER MAINTENANCE—Rotor reversal balances wear, eliminates hand turning of hammers, saves labor and parts.

LET US "PROVE IT"

Send us 100 lb. sample of your material—and specifications for the finished product you want. At no obligation or expense to you, we will run tests in our laboratory and give you the results and recommendations.

FREE BULLETIN

Your Pennsylvania Engineer will be glad to discuss these crushers with you . . . or write for free bulletin.

PENNSYLVANIA CRUSHER DIVISION
BATH IRON WORKS CORPORATION
WEST CHESTER, PENNA.

PENNSYLVANIA CRUSHERS

BATH-BUILT

Enter 1234 on Reader Card

POWER BU

and a choice of 980 models makes Allison

When we first started out in this power-shift business 17 years ago, we figured we'd have to build only a handful of models. Field experience got us over that idea in a hurry. Today we build 980, so you get the model that's precisely right for your needs.

But that's just one of the things we learned building almost 175,000 power-shifts.

We found out you had to know a lot about metals if you're going to make a power-shift that stands up. So we hired professional metallurgists, installed a bank of 30 heat-treating furnaces.

We discovered it's a good idea to check out designs on an analog computer; to prove them out with pilot models on the job; to completely test every power-shift before you ship it.

And we came up with a slick way to eliminate heat buildup, complicated torque splitters and engine power waste: Use "free wheeling"—not fixed—stators in your torque converters.

A list of all the things we've learned in building power-shifts backed by quality standards unsurpassed in the industry would fill a good-size book. We haven't bothered to write it. But we've got something that's maybe more impressive.

It's a list of the many large and small manufacturers who build TORQMATIC power-shifts into their equipment — and stake a good part of their reputation on TORQMATIC DRIVES each time they do. Want their names? And the equipment they build? Mail the coupon today.

– SHIFT IS OUR SINESS

Torqmatic Drives a wise choice for your business

Allison TORQMATIC
TORQMATIC DRIVES

THE WORLD'S MOST COMPLETE LINE OF HYDRAULIC DRIVES
Over 980 Models used by 125 Manufacturers in
100 to 600 H. P. Equipment

ALLISON DIVISION OF GENERAL MOTORS
BOX RP 12, INDIANAPOLIS 6, INDIANA

Please send me the list of equipment built with Allison TORQMATIC DRIVES.

Name_____

Title_____

Company_____

Street Address_____

City_____ Zone_____ State_____

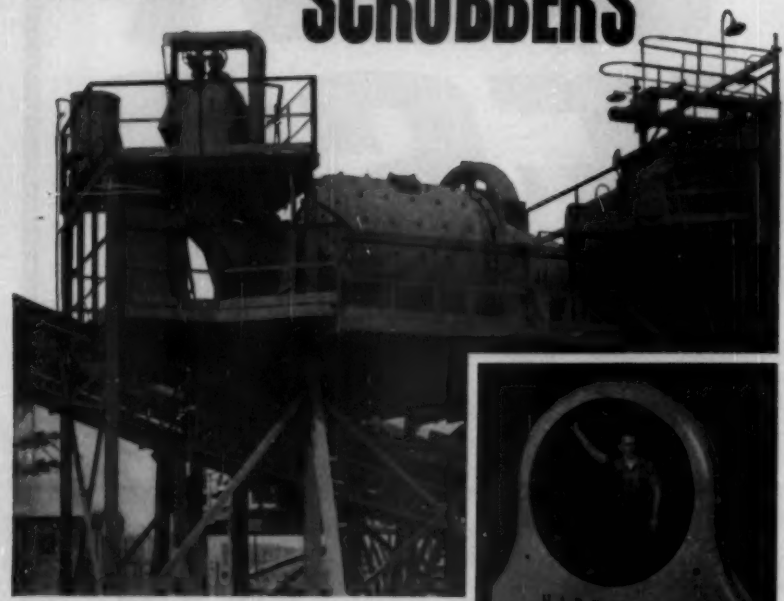
Enter 1239 on Reader Card

looking toward
IMPROVED PRODUCTION
... look to Hardinge !

The large diameter, short-length trunnions used on Hardinge Conical Scrubbers permit chute feeding of unsized ore and rock at rates up to 800 tons per hour. The superincumbent mass action of the charge quickly slurries the clay and dirt, permitting ready separation on washing screens or trommels.

Hardinge Scrubbers are in wide use in cleaning such diversified materials as limestone, phosphates, iron ore, river gravel, ganister rock, dolomite, abrasives, and in separating clay from rock and gravel.

HARDINGE
CONICAL SCRUBBERS



A 10' diameter by 84" long Hardinge Conical Scrubber scrubbing 5" iron ore.

A Hardinge Scrubber bearing—inside diameter 60".

Ask for Catalog 37-B-7

HARDINGE
COMPANY, INCORPORATED
Main Office and Works • 240 Arch St., York, Pa.
"Hardinge Equipment—Built Better to Last Longer."

NEW YORK
TORONTO
CHICAGO
HIBBING
SALT LAKE CITY
SAN FRANCISCO
HOUSTON
LAKELAND
BIRMINGHAM

Enter 1248 on Reader Card

Industry News

continued from page 52

Miami area gets new aggregates plant

A 160-acre site with an 8 million ton deposit is being worked near Miami, Fla., by Coral Aggregates, Inc. It is turning out 4,500 tpd. of aggregates, plus by-products of marl and sand.

Owners of the company are Murray and Sam Levine, of Samson Concrete Industries and Samson Block Co.

Canadian limestone output leveled off in 1960

The record limestone production year in Canada was 1959. In 1960, shipments for purposes other than cement and lime production sank from 36.7 million tons to 34.6 million tons, with value decreasing from $46 million to $43.1 million. Limestone intended for cement and lime totaled 10.2 million tons in 1960, a million tons less than the preceding year.

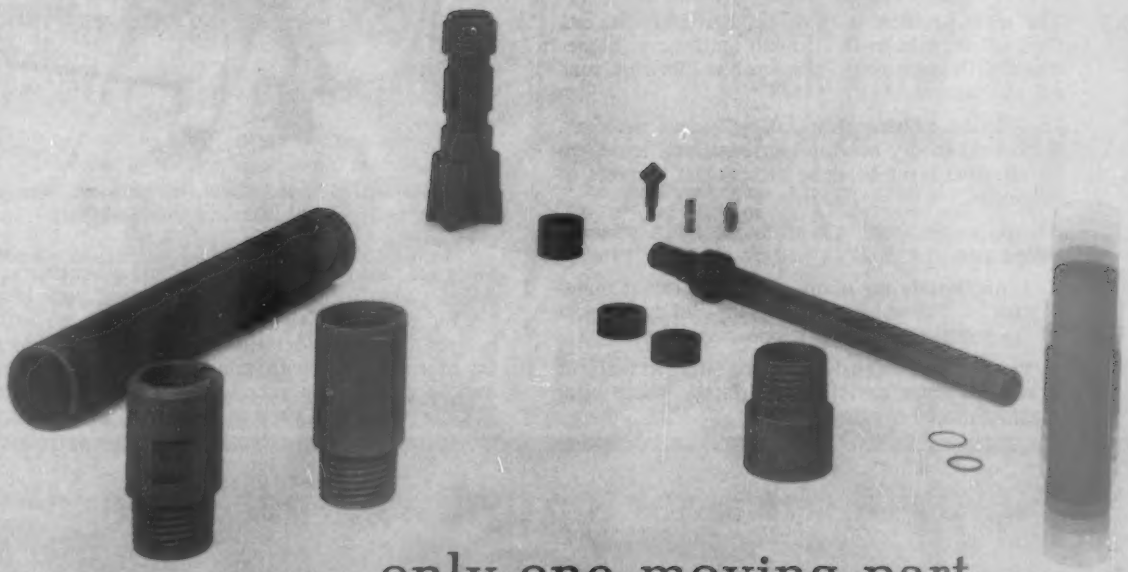
Approximately 450 quarries were in operation last year. Although they are located in all the provinces except Saskatchewan and Prince Edward Island, over 90 percent of Canadian limestone comes from southern Ontario and southern Quebec.

Correction, please!

We wish to set the record straight about some misinformation that was published in our September 1961 issue, concerning a cement plant to be built in the Ravena, N.Y., area. The top-page item on page 71 of the above issue is incorrect. For full and complete information about the new cement plant of Atlantic Cement Co., Inc.—and that's the company concerned—please refer to page 58 of the May 1961 ROCK PRODUCTS.—**The Editors.**

Please turn to page 60

Enter 1249 on Reader Card



only one moving part makes dependable percussion drilling power

The piston is the only moving part, which means less wear and less trouble. No complicated valving to sand up as in many bottom hole pneumatic impact tools. You can easily change the choke which adjusts the Hammerdril to the air volume needed from your 100 psi compressor. The Series 100 Hammerdril® is an air miser, too. All the air goes through the Hammerbit® to clean or to drill. None is wasted. This splined, one piece Hammerbit has heavy tungsten-carbide inserts for long life. Service is available in your area. Write for new bulletin.

MISSION MANUFACTURING CO.

HAMMERDRIL

P. O. BOX 4209 · HOUSTON, TEXAS / OVER THIRTY YEARS OF DRILLING RESEARCH

LUBE LOGIC

Five tips on

Don't let girth-gear teeth lose their bite

One of the toughest lube problems in a cement mill is keeping the girth gear and drive pinion on a rotary kiln properly lubricated.

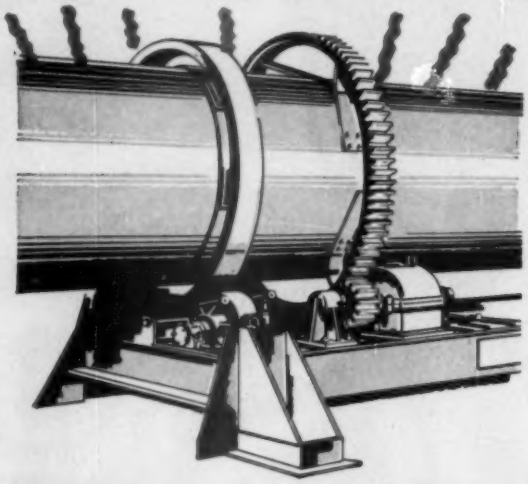
The main problem is heat, radiated from the hot shell of the kiln to the driving machinery. Sometimes girth gears get so hot that the lubricant runs off like water.

In addition to heat, dust and grit are a problem. Both tend to dry out the lubricant, and to set up an abrasive layer between the contact surfaces of the gears.

The only safe solution is a lubricant with *all* these properties:

1. High liquefying point, so the lubricant maintains a protective film between the sliding surfaces of the gears even at high temperatures.

2. Pronounced adhesiveness, or stickiness, so the grease stays on the sliding surfaces, where wear occurs, instead of running off.

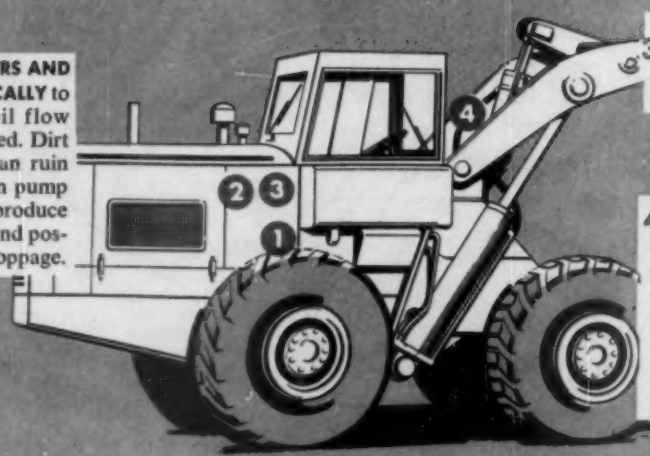


3. Proper body, or thickness, to withstand heavy loadings and prevent abrasive contaminants from chewing up gear surfaces.

Since gear loadings, temperature and other characteristics vary from one kiln to another, your best bet for getting the right lubricant for the job is to ask the Texaco Lubrication Engineer. He's had a lot of experience with kiln-lubrication problems, and he can suggest exactly the right lubricant to lick the problem in your equipment.

Four-point check for top hydraulic performance

1 CLEAN OIL FILTERS AND SCREENS PERIODICALLY to make sure the oil flow isn't being restricted. Dirt in hydraulic oil can ruin close tolerances on pump and valve parts, produce erratic operation and possibly complete stoppage.



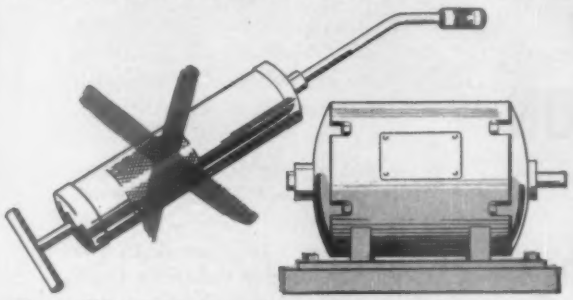
3 KEEP RESERVOIR BREATHER CLEAN.

4 KEEP RUBBER HOSES FREE OF CRIMPS. Kinks in flexible lines restrict oil flow. Also, kinked spots wear fastest, and particles of rubber may break off into the oil, plug the filter or make moving parts stick.

2 KEEP OIL AT CORRECT LEVEL in reservoir. Low oil level admits air into the system. Air makes foam, and foam produces erratic operation, loss of power, "creep" from set position.

ABOVE ALL, make sure you're using the right grade of hydraulic oil. Using the wrong viscosity (too thick in cold weather or too thin in hot weather) leads to foaming, noisy pump operation and pump overheating.

extending equipment life

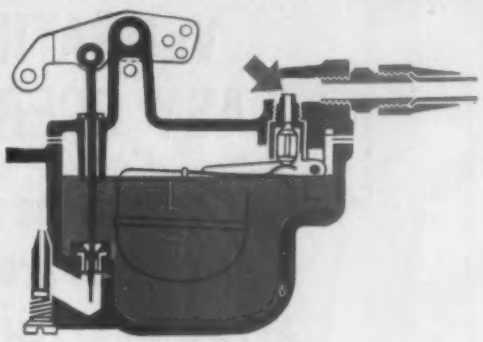


Don't use gun for grease-lubricated motor bearings

Most electric motor bearings are pre-packed with grease at the factory, either by the bearing or motor manufacturer. If re-lubrication is specified for grease-lubricated bearings, the only right way to do the job is the same way it's done at the plant: with the motor disassembled. Even if the motor has a grease fitting, don't try re-lubricating them with a grease gun. It's practically impossible to gauge accurately how much grease you're pumping into the motor bearings, and over-lubrication almost always leads to leakage of lubricant and damage to the armature and commutator. Moral: if you do have to re-lubricate a grease-lubricated electric motor, disassemble the motor, wash the bearings thoroughly in a solvent, and repack the bearings by hand.

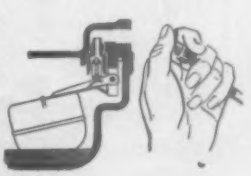
Protect diesel fuel injector with periodic tank drains

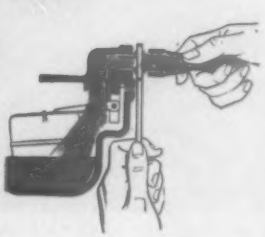
Dirt and water in diesel fuel can ruin a fuel injector in no time. Even if you keep the fuel clean during storage, there's still a good chance that temperature changes will create enough condensation in the fuel tank on your rig to start rusting in the injectors. Several operators have pretty well solved this problem by partially draining the fuel tank once or twice a week. Simply draw off about a gallon of fluid through the drain valve at the bottom of the fuel tank. You lose some fuel this way, but you also get the accumulated water and other contaminants clear out of the fuel system. The cost of the fuel you drain off is a small loss compared to the repair bills you can save on the fuel injectors.



Quick cure for carburetor flooding

Repeated stalling and hard restarting is often caused by a tiny particle of grit, which lodges under the carburetor float needle valve, lets too much gasoline into the carburetor and causes flooding. You can cure this problem (sometimes permanently) with the following routine: disconnect the fuel line at the carburetor and plug it with a cork, a pencil or anything else that will fit. Then run the engine until you've used up all the fuel in the carburetor. Re-connect the fuel line, crank the engine, and the rush of gasoline into the empty carburetor will usually flush the foreign matter out of the needle valve seat. If you have a friend but no cork, have the friend start the engine while you plug the disconnected line with your thumb. Same difference.





TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers," little angles, so easy to overlook, where big savings in money and time can be made. If Lube Logic doesn't solve your problem, call your local Texaco Lubrication Engineer. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N.Y.

TUNE IN: HUNTLEY-BRINKLEY REPORT, MON. THROUGH FRI.-NBC-TV

TEXACO

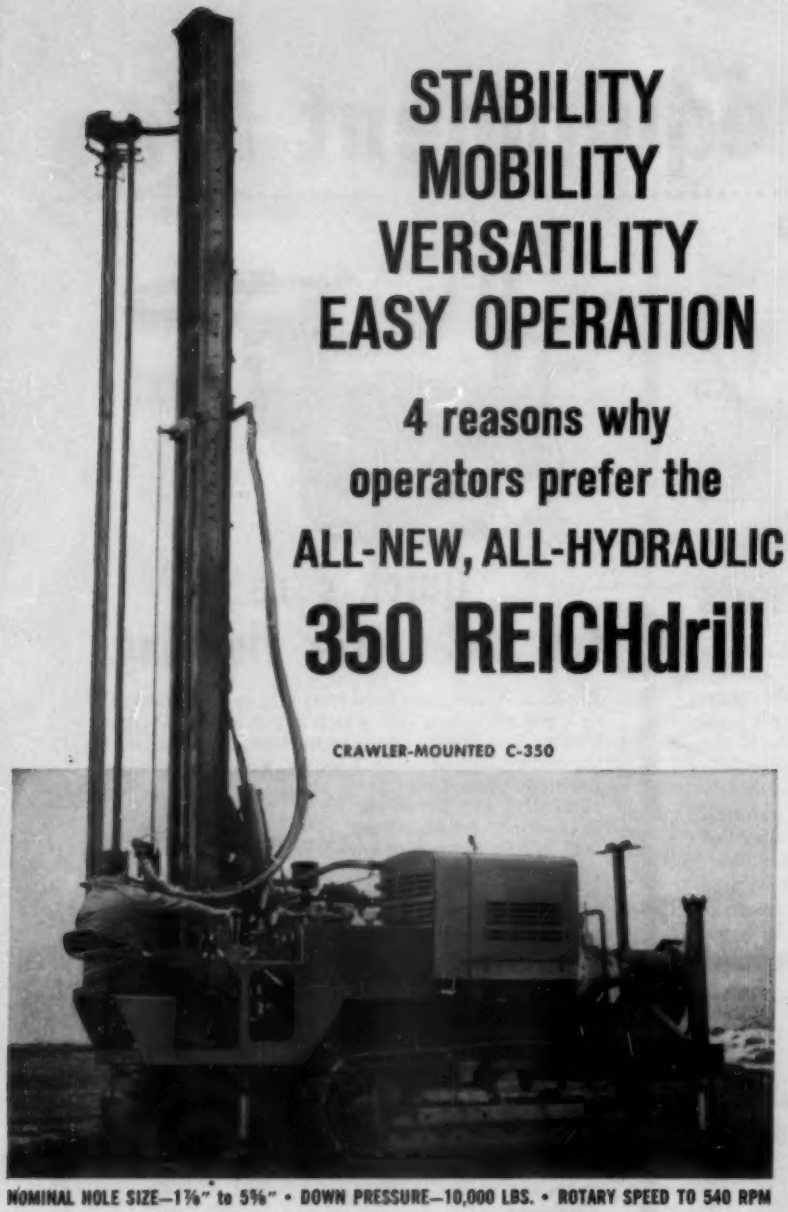
Throughout the United States

Canada • Latin America • West Africa

STABILITY MOBILITY VERSATILITY EASY OPERATION

4 reasons why operators prefer the ALL-NEW, ALL-HYDRAULIC 350 REICHdrill

CRAWLER-MOUNTED C-350



NOMINAL HOLE SIZE—1⅞" to 5⅝" • DOWN PRESSURE—10,000 LBS. • ROTARY SPEED TO 540 RPM

Easy Operation is assured by all-hydraulic, labor-saving controls. *Stability* is provided by 14" wide tracks, low center of gravity and 8'8" wide frame plus 3 REICH heavy-duty hydraulic leveling jacks. *Mobility* is high because the crawler-mounted 350 trams at 7.8 MPH; climbs 25% grades, turns in its own length. *Versatility* is basic in REICHdrill design. The 350 is at home blastholing with 3-cone rotary bits, In-Hole Drills, or drag bits; coring or prospecting.

A truck-mounted T-350 REICHdrill for greater mobility with all the above advantages, is also available. Get detailed specifications.

Ask for SP-5001-2

REICHdrill

FRANKLIN (VENANGO COUNTY), PENNA.

Division: CHICAGO PNEUMATIC TOOL CO.

Enter 1250 on Reader Card

Industry News

continued from page 56

NCSA joins zoning battle, Supreme Court accepts brief

In the U. S. Supreme Court case of Goldblatt v. Town of Hempstead, where the decision will be of great significance regarding the zoning of stone producers, the National Crushed Stone Association is making its influence felt.

It has been privileged, in the face of opposition from the town of Hempstead, to have a motion and brief accepted as "amicus curiae" ("friend of the Court"). This means that Supreme Court members will have the brief before them at the time of the case. A decision is expected to be reached early in 1962.

"Cake salt" brings a novel industry to New Brunswick

At Weldon, New Brunswick, diamond drilling has begun on a sodium sulphate deposit and tests are being made to determine the most economical method of recovering it from the core.

Sifto Salt Ltd., a subsidiary of Dominion Tar & Chemical Co., foresees a thriving business if tests give satisfactory results. Within three or four years it will establish a mine and plant at the present site.

Sodium sulphate finds use in the production of kraft paper, glass and detergents, among other things. At present, demand throughout the eastern U. S. and Canada amounts to about 800,000 tpy.

South Carolina silica plant

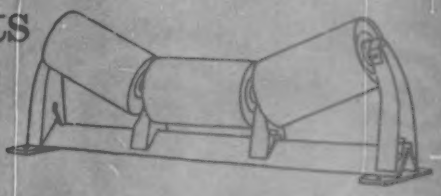
Pennsylvania Glass and Sand Corp. is building a $1 million plant near Columbia, S.C. It will process silica to be used in the manufacture of glass, ceramics, chemicals and in the building and metallurgical industries.

Please turn to page 65

Enter 1251 on Reader Card

Note: Snap shot of 54" wide belt conveyor handling coal. Grease leads plugged and welded to prevent regreasing. 7 years later idlers were inspected. Had handled 16,150,000 tons of coal... made 646,153,000 revolutions while logging 36,185 hours. And they're still running quietly and freely! A few of the reasons are noted below.

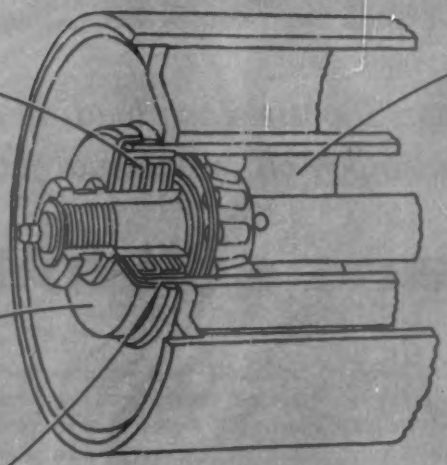
A maintenance engineer reports on Link-Belt idlers . . . explains why they made



646,000,000 revolutions without regreasing

Exclusive cartridge seal protected the bearings three ways... a laminated felt-neoprene contact member... a multi-labyrinth... and grease filled clearances.

Now! Rolls have deflector cap for even greater bearing protection.



Large grease reservoir! Full length, large diameter center tube is completely filled at the factory. Important! This prevents "breathing" in dirt due to temperature changes.

Machined "seats" for bearings and seals assure perfect alignment in heavy gauge center tube.

Conclusion! Grease stayed in! Dirt stayed out!

Long-lasting dependability is just part of the story. You can also count on minimum maintenance and *longer belt life* when you choose Link-Belt idlers . . . *industry's broadest* line. "Pin-point" selection to suit the service. Many types and sizes, roller bearing and ball bearing, for light, medium, heavy-duty service, 20°, 35°, 45° types. For full details, contact your nearest Link-Belt office or authorized stock-carrying distributor. Look under CONVEYORS in the yellow pages of your telephone directory. Ask for Belt Conveyor Idler Book 2816.

LINK-BELT

BELT CONVEYOR IDLERS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs; Switzerland, Geneva. Representatives Throughout the World. 15,734

Self-loading day overburden into 15 yd scraper, Michigan reaches spill-point in slightly over 1 minute. Total time for typical 4200 ft cycle, 6.7 minutes.

Big 4½ yd Tractor Shovels slash loading costs at Midwest pit, also pay off on unusual jobs

Michigans self-load scrapers,

Perhaps the most *unexpected benefit* of big Michigan Tractor Shovels is that their power, capacity and weight are helping them do jobs previously considered much too tough for any kind of loader.

The experiences of Crystal Lake Trucking & Excavating Co., Algonquin, Illinois, operated by brothers Bill, John and Herbert Pfeifer, provide an excellent case in point.

Outproduces 4 yd dragline

Besides dramatically slashing truck-loading costs, one of this company's four Model 275A Michigans has out-produced a big (4 yd) dragline on hopper-feeding assignment. The 4½ yd Michigan moves material faster and at less cost than any other method, according to company president Bill Pfeifer. And it keeps production high even when stone has to be brought from stockpiles scattered 200 ft and more away. Bucket loads average 6 tons; haul speed, 7 mph; return, 14 mph.

Doubles scraper output

Another of Crystal Lake's 290 hp Model 275 A's equipped with double-drum cable-control, *self-loads* a 15 yd scraper to strip overburden. "Michigan power plus its 14 to 28 mph speed give us twice the production on typical 2000 ft hauls as crawler prime movers," says Mr. Pfeifer. "Its big tires have ended our worries over track wear. And because its mobility permits quick shifting to scraper work when loading demands slacken, we've eliminated the expenses of a separate tractor."

Truck-loads 18,000 tons daily

Savings are substantial too on truck-loading assignment. Three passes and 60 to 90 seconds heaps a typical 15 yd hauler . . . *one-third to one-half the time formerly needed by Crystal Lake's 1¾ yd Tractor Shovel.* In a 10-hour day, each of the three 4½ yd Michigans has loaded as much as 6,000 tons of sand, gravel and stone. Costs, based on national ownership and operating averages, are under 2.7 cents per ton.

Carrying crushed stone, Michigan averages 6 tons per bucket-load. In 3½ hours, unit will haul 2000 tons to washer hopper.

speed dragline-type feeding

How about your layout? Can this speed and power help cut costs on your loading, digging or towing jobs? Or do you need more (or less) than 262 hp, 4½ yds; and 48,000 lbs of weight? We have it . . . nine job-proved Michigan models, 42 to 335 hp; the biggest one, 62,000 lbs strong, takes buckets from 6 to 12 cubic yards. Call us for detailed specs, prices . . . and a no-obligation demonstration.

Loading typical 15 yd hauler takes the 4½ yd Michigan 1 to 1½ minutes.

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK EQUIPMENT

2481 Pipestone Road
Benton Harbor 42, Michigan

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

Area Faces Gravel Bed Depletion*

That will mean that producers will have to begin hauling it in from other watercourses, and it takes relatively few miles of hauling to double the cost of concrete.*

In a 28-page report titled "Sand and Gravel Resources," th[illegible]

* From a recent report on gravel resources in one of the country's leading construction markets.

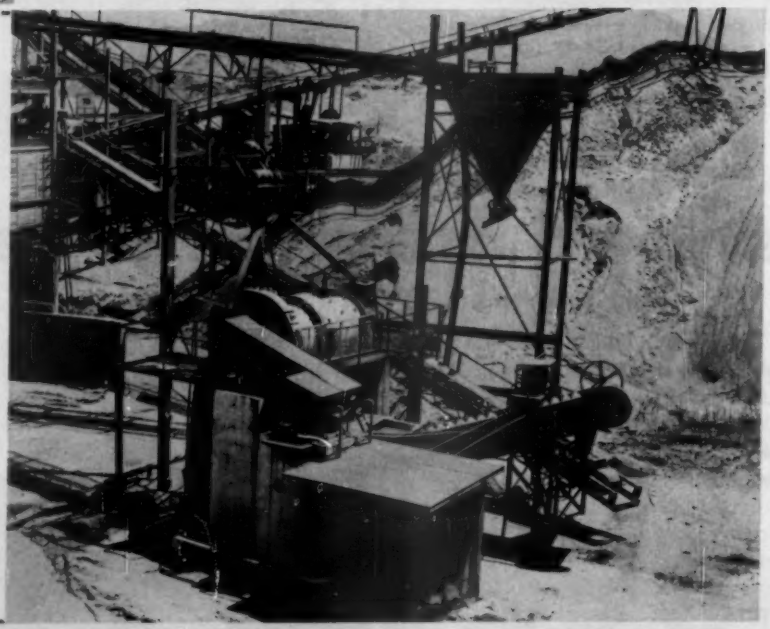
Manufacturing sand from stone and waste pea gravel with Marcy CPD Rod Mills is one way to...

conserve natural sand resources

and reduce costs

With a Marcy Center Peripheral Discharge Rod Mill you can produce whatever size fine sand you need, from stone or waste pea gravel, right on the job, for only 25c per ton. The flexibility of Marcy grinding permits changing gradation to meet a wide variety of specifications... provides a uniform, cubical product which makes better concrete.

Write for complete information.



The Company that cares enough to give you the best!

Manufacturing Division

MINE AND SMELTER SUPPLY CO.

DENVER 16, 3800 RACE ST. | NEW YORK 17, 122 E. 42nd ST. | SALT LAKE CITY 1, 121 W. 2nd S. | EL PASO, 1515 11TH AVE. | ALBUQUERQUE, 701 HAINES N.W.

Licensed Manufacturers and Sales Agents in Canada, Australia, Sweden, England, South Africa; Sales Agents in Mexico, Peru, Chile, Philippine Islands, Japan, New York City (for Continental Europe) and in principal cities of the United States.

Enter 1206 on Reader Card

NISA learns seven factors affecting business success

Those attending the annual meeting of the National Industrial Sand Association, October 20, heard that there are four crucial problem areas and three fields of opportunity basic to success in business.

Speaker Stuart Berman, an associate with the management consulting firm of Booz, Allen & Hamilton, brought out that the last decade's profit squeeze has often resulted in net sales increasing as much as 200 percent, while pre-tax margins on sales decreased 40 percent and net return on investment has also equally declined.

Four problems were mentioned as barriers to profitability. (1) Labor costs have usually risen considerably faster than either prices or productivity. (2) Foreign competition, encouraged by many factors—primarily by lower hourly direct wage-fringe costs—is on the increase. (3) The current shortage of executives is expected to grow more severe. (4) Product life cycles are continually growing shorter.

But there are three basic opportunities by which companies can definitely up their profits. (1) Cost reduction programs—either on a "crash" or on a long-term basis—are steadily proving their worth. (2) New products should be acquired either through internal research and development or by purchase or merger. (3) Top management is more successful when it devotes more time to planning tomorrow's business than to day-to-day operation problems.

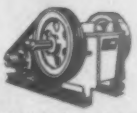
Red Rock Quarry routs breakdown jinx

The tough, "slabby," 76 percent silica sandstone being quarried at Red Rock Quarry Co., Nesquehoning, Pa., placed terrific stresses on the wobbler feeder drive during initial impact and separation. An operator had to be on hand to jog the machine so that maximum material flow could be maintained, and the unpredictable strains led to entirely too much downtime.

Now a mechanical adjustable speed drive (G. E. Polydyne) has saved the day. Since installation of the 15-hp. unit (see center of photo), Foreman Lloyd Green reports no drive downtime except for routine lubrication.

Please turn to page 67

Laboratory Crushers and Pulverizers

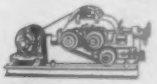


4"x 6" Massco Laboratory Jaw Crusher

Welded steel frame; manganese steel jaw and cheek plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjust for plate wear and product size by convenient hand wheel adjustment.

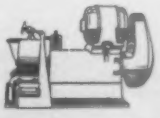
6" and 10" Massco Gy-Roll Reduction Crusher

Reduces ½" feed to as fine as 10 mesh in single pass. High capacity, low power consumption.



Laboratory Crushing Rolls

Sizes (Diameter x width): 10"x 6" and 12"x 8". Adjustable roll space setting up to ¾". V-belt drive. Heavy, cast frame absorbs vibration, results in long life.



Massco-McCool Pulverizers

Disc type grinder with a planetary movement. No gears. Will grind ¼" to 150 mesh in one pass.

Marcy Pulp Density Scale

Gives direct reading of weight; specific gravity of liquids, pulps, and dry solids; percent solids in pulp. Very accurate. Easy to clean.

MINE AND SMELTER SUPPLY CO.

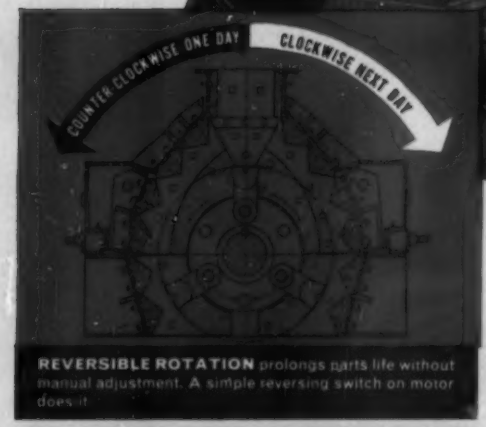
The Company that cares enough to give you the best!

3800 RACE STREET
DENVER, COLORADO

OFFICES AND AGENTS IN PRINCIPAL CITIES

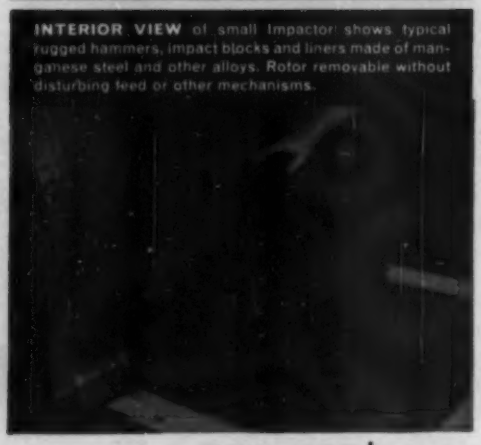
Enter 1252 on Reader Card

More efficient CRUSHING AT LOWEST COST for labor, power and upkeep with WILLIAMS REVERSIBLE IMPACTOR



REVERSIBLE ROTATION prolongs parts life without manual adjustment. A simple reversing switch on motor does it.

INTERIOR VIEW of small Impactor shows typical rugged hammers, impact blocks and liners made of manganese steel and other alloys. Rotor removable without disturbing feed or other mechanisms.

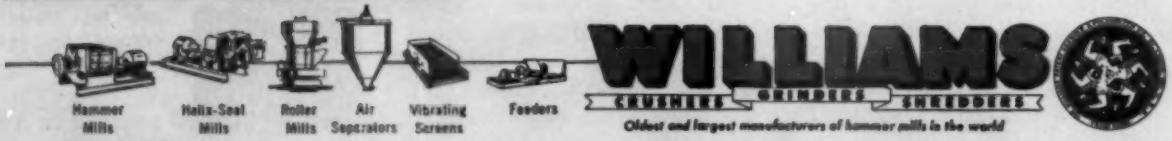


For secondary crushing, the economy and high production of a Williams Reversible Impactor is unequalled, whether raw material is hard and abrasive or soft and friable. Precision control of specified top-size is easy, usually in a closed circuit system, from a coarse 2" with minimum fines, down to 35 mesh or finer.

The Impactor has no grates. Material fed into the mill is reduced to proper size while rebounding between the whirling hammers and impact blocks, until discharged from bottom opening. Grinding or rubbing action is eliminated—power, replacement parts and downtime are reduced to a minimum. No fine adjustments need be maintained.

Reversible rotation is a prime feature of the Williams. So is *Wide Open Accessibility* to interior. So are the *Interchangeable Impact Blocks* to balance wear. So are the many other exclusives that hold cost-per-ton to the very lowest. There is a size and model for your exact needs. *Write for catalog.*

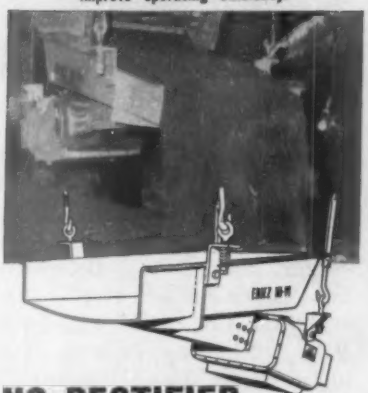
WILLIAMS PATENT CRUSHER AND PULVERIZER CO.
800 St. Louis Ave. • St. Louis 6, Mo.



Enter 1226 on Reader Card

ERIEZ Magnetic Minute

60 seconds that will help you improve operating efficiency.



NO RECTIFIER NEEDED WITH ERIEZ HEAVY-DUTY VIBRATORY FEEDERS

PATENTED

AC powered Eriez Hi-Vi vibratory feeders move large tonnages of bulk materials with accurate control . . . more efficiently and economically. Illustration shows one of a number of Eriez units available for heavy feeding applications where **big capacity and accuracy** are essential.

Whatever your application, there is an Eriez electro-permanent magnetic feeder that will meet your exact needs. And you get this exclusive combination of advantages: No rectifier needed . . . AC operation. Totally enclosed drive element ideal for hazardous, dusty, wet and corrosive installations. New fibre glass springs assure superior performance and control . . . longer life because spring breakage is practically eliminated.

The full line of Eriez Hi-Vi vibratory feeders includes models with feeding capacities ranging from ounces to many tons per hours.

Write for descriptive bulletin to:

ERIEZ MANUFACTURING CO.
202ZA Magnet Dr., Erie, Pa.
Eriez of Canada Ltd., P.O. Box 5, Sta. W-Toronto, Ont.

MAGNA-THOUGHT

Constant research, development and refinement are the keys to new and improved products. New and improved products are the keys to a company's growth.

A. F. ISRAELSON
Chief Engineer

ERIEZ

A GROWTH COMPANY . . .
10 NEW PRODUCTS IN THE LAST 5 YEARS

Enter 1255 on Reader Card

Industry News

continued from page 65

King-size crusher

This huge 54-in., 400-hp. gyratory crusher, although being installed at an Arizona copper project, is the same size and type now being used at a mid-western crushed stone plant (see ROCK PRODUCTS, June 1960, p. 84). The rock products industry is not to be outdone by other fields of mining in the trend toward "king-size" equipment. (WKE photo)

Explosives fire hazard study underway

The Manufacturing Chemists' Association, Inc., is staking a $60,000 research project by the Bureau of Mines on the fire hazards of ammonium nitrate and such related systems as nitric acid-hydrocarbon, ammonium nitrate-ureau and combinations.

The research, which will include the effects of contaminants and of confinement on the detonability of solid and molten ammonium nitrate, and evaluate its sensitivity to initiation by the close proximity detonation of other explosive systems, will be carried out under the direction of Dr. Robert W. Van Dolah, chief, Explosives Research Laboratory, Pittsburgh, Pa.

Please turn to page 68

ERIEZ Magnetic Minute

60 seconds that will help you improve operating efficiency.

CLOGGED BINS A PROBLEM?

If troublesome slowdowns caused by sticking, arching, stubborn materials are your problem, here's good news:

Eriez Hi-Vi® electro-permanent magnetic Unit (Bin) Vibrators are your answer. They've proven superior time and again for dependable movement of stubborn masses of granular, lumpy or powdered materials in bins or hoppers.

Their concentrated vibration is directed to deliver maximum efficiency precisely where it is needed. The full Hi-Vi line offers models for use with all sizes of bins with wall thickness to ½" — Special models are available for hazardous, dusty locations.

All models bring you these advantages.

- Direct AC operation — no need for rectifiers.
- Lower operating and maintenance costs.
- Compact, light-weight, easy to install.
- Weather-and-dust-resistant housings at no extra cost.
- No sliding or rotating parts.
- No wear, no lubrication.

Get the Hi-Vi unit that's exactly right for your operation. Full technical data is available in our new bulletin. Write for it to:

ERIEZ MANUFACTURING CO.
202ZB Magnet Dr., Erie, Pa.
Eriez of Canada Ltd., P.O. Box 5, Sta. W-Toronto, Ont.

MAGNA-THOUGHT

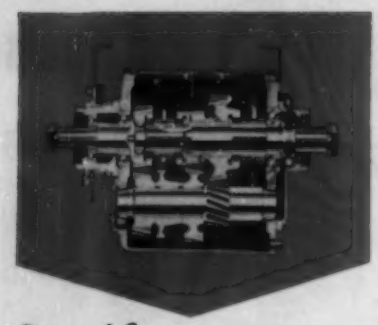
The manufacturer who does the most for his customers is the one who is qualified to provide application know-how as well as superior products.

WM. H. BENSON
Supervisor Vibration Engineering

ERIEZ

A GROWTH COMPANY . . .
10 NEW PRODUCTS IN THE LAST 5 YEARS

Enter 1256 on Reader Card



Specify

FULLER

Specify the

MODEL

For medium-heavy duty trucks and tractors specify the

FULLER '65 SERIES

3-SPEED AUXILIARY

- High capacity
- Widest range of ratios
- Top-mounted power take-off optional
- Low initial cost, reduced maintenance
- Available from all truck manufacturers on specification

65 SERIES (Medium-heavy-duty) RATIOS

	SPLITTER RATIOS		DEEP REDUCTION
MODEL	High	Intermediate	Low
3-A-65	.754	1.00	2.221
3-B-65	.804	1.00	1.239
3-C-65	.754	1.00	1.239
3-D-65	.804	1.00	2.221
3-E-65	.804	1.00	1.74
3-F-65	.754	1.00	1.74
3-G-65	1.00	1.32	2.221
3-H-65	1.00	1.32	1.74

Specify

Specify the **MODEL**

FULLER TRANSMISSION DIVISION

EATON MANUFACTURING COMPANY

KALAMAZOO, MICHIGAN

Enter 1257 on Reader Card

Industry News

continued from page 67

Directors elected for National Limestone Institute

Directors and vice presidents for Region II were elected recently for terms expiring in 1965. For the Agricultural Limestone Division they are: J. B. Allen, The Allen Co., Inc., Winchester, Ky.; Kent Angerer, River Products Co., Iowa City, Iowa; P. D. Archibald, Callanan Road Improvement Co., S. Bethlehem, N.Y.; R. O. Bemis, Basic Dolomite, Div. of Basic, Inc., Cleveland, Ohio; Roy C. Chapin, Jr., J. E. Baker Co., York, Pa.; C. E. Conklin, Conklin Limestone Co., Lincoln, R.I.; Willard A. Hulshizer, Limestone Products Corp. of America, Newton, N.J.; Russell W. Hunt, Southwest Lime Co., Neosho, Mo.; R. C. Jackson, Lambert Bros. Div., Vulcan Materials Co., Knoxville, Tenn.; R. D. Lawlor, Lebanon (Tenn.) Limestone Co.; J. B. Mount, Maymead Lime Co., Shouns, Tenn.; W. M. Palmer, Jr., Dolomite Products, Inc., Ocala, Fla.; Perry Pederson, Pederson Bros., Harmony, Minn.; Powell G. Potts, Southern Stone Co., Inc., Franklin, Ky.; R. A. Raese, Greer Limestone Co., Morgantown, W. Va.; Charles Rich, Swanton (Vt.) Lime Works, Inc.; T. W. Shaw, Central Limestone Co., Morris, Ill.; D. A. Yeoman, Yeoman Stone Co., Kokomo, Ind., and George A. Ziegler, M. J. Grove Lime Co., Div. of Flintkote Co., Lime Kiln, Md. Vice President Region II is Arnold W. Mulzer, Mulzer Bros., Tell City, Ind.

Crushed Limestone Division directors are: Alvin R. Armbrust, Fayette Limestone Co., Inc., Washington Court House, Ohio; Arly H. Brooks, Brooks Quarry, Inc., Kahoka, Mo.; Marshall E. Carr, Carr Rock Products Co., Neodesha, Kan.; Mrs. Buford V. Everett, Everett Quarries, Inc., Plattsburg, Mo.; L. R. Falk, L. R. Falk Construction Co., St. Ansgar, Iowa; W. O. Faylor, Faylor Lime & Stone Co., Winfield, Pa.; R. R. Holland, Alexander Stone Co., Inc., Marion, Ky.; Chester Hopper, Hopper Bros. Quarries, Weeping Water, Neb.; R. E. Meshberger, Meshberger Stone Co., Columbus, Ind.; Einar Nielsen, Hector Construction Co., Inc., Caledonia, Minn.; Nicholas Pallette, Pallette Stone Corp., Saratoga Springs, N.Y.; William Rees, Rees Construction Co., Monroe, Wis.; William J. Ryan, P. W. Ryan Sons, Inc., Janesville, Wis.; H. R. Schneider, Servtex Materials Co., New Braunfels, Texas; Frank Thomas, Thomas' Quarry, Winchester, Ill.; Martin Valstad, Valstad Quarry, Carrollton, Ill.; R. S. Waters, Waters Construction Co., Decatur, Ala.; Clarence Weiss, LaCrosse, Wis.; Gordon C. Willis, Rockydale Stone Service Corp., Roanoke, Va., and Percey B. Ferebee, Nantahala Talc & Limestone Co., Andrews, N.C. (2-year term). Region II Vice President is H. C. Wolfe, Wyandot Dolomite, Inc., Carey, Ohio.

Oregon adopts new sand and gravel legislation

Considerable legislation of importance to the mineral industries was passed during Oregon's last state assembly. Of specific interest to sand and gravel producers were policies requested by the State Game Comm. and the Fish Comm. of Oregon.

Generally stated, the laws strive "to protect the scenic and recreation resources, public health . . . and conserve plant, aquatic and animal life." To that end, the Game and Fish Commissions are to be consulted in the future before the State Land Board leases deposits.

Please turn to page 70

Enter 1258 on Reader Card

LE ROI LRD-3 for powerful, deephole rotary drilling

Here's the *big* rig . . . completely self-contained for putting down hole as large as 7⅞ in. to 100 ft. depth!

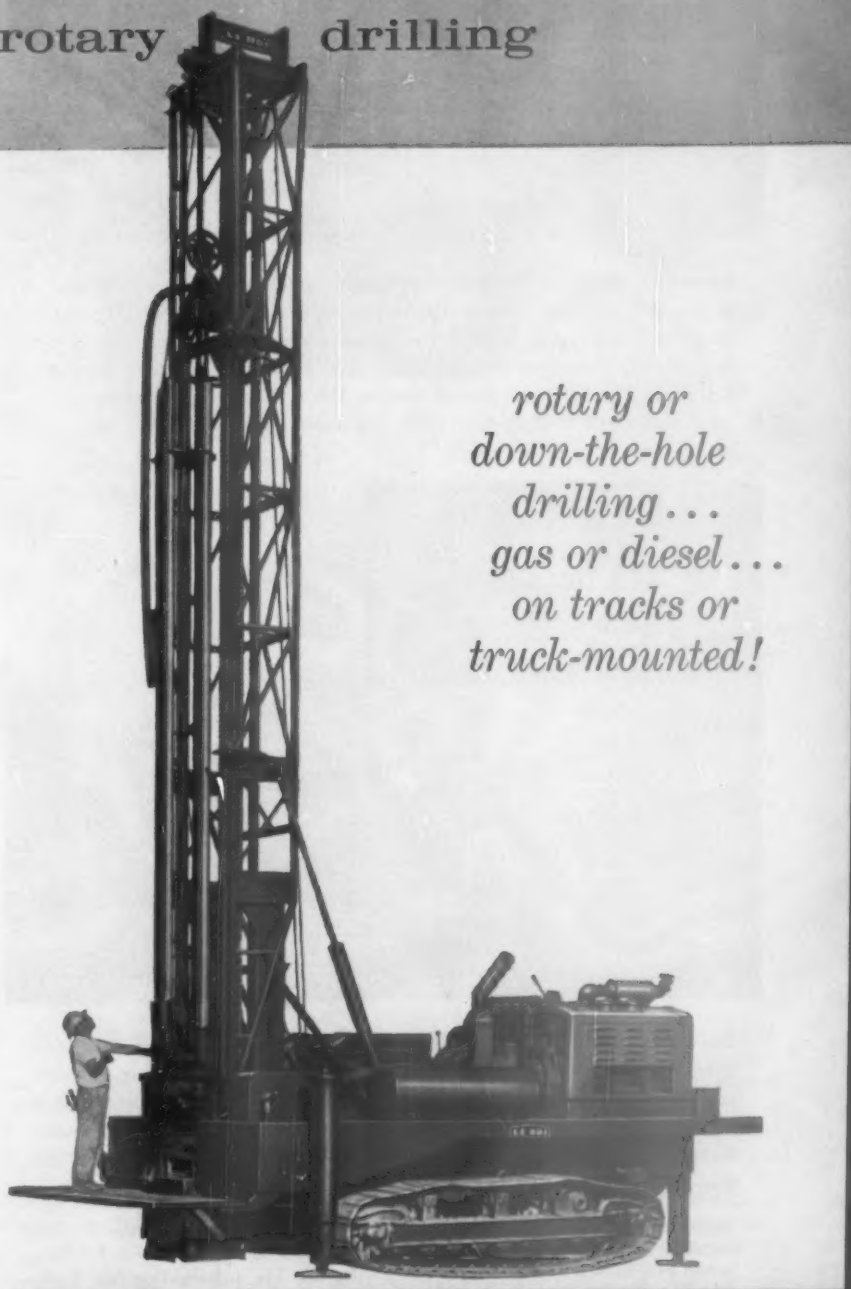
The LRD-3 is available with either crawler or truck mounting. An enclosed cab can be furnished to provide all-weather protection for the operator while drilling. All controls are conveniently grouped for easy operation and good visibility.

The traveling head design of the LRD-3 provides positive mechanical power without excessive torque loss under heavy pulldown, and permits easy control in making up and breaking down drill pipe. Every function of the unit is designed to speed productive drilling and keep the operator making hole. Leveling, raising the mast, and even the automatic drill pipe magazine are hydraulically controlled for speedy operation. A powerful dust collector traps cuttings and blows them well away from the unit.

An extra-sturdy 4-speed chain-hydraulic pulldown puts up to 30,000 lbs. of pressure on the bit of the LRD-3. A rugged dual-range transmission provides rotary speeds from 9 to 168 rpm in a selection of 10 forward and 2 reverse speeds.

Where needed, the rotary bit can be quickly changed for a powerful down-the-hole drill. A Le Roi 100 hp dual-manifold air compressor provides plenty of 100 psi air for punching through tough rock with the down-the-hole drill, or it can be set to deliver 625 cfm of 40 psi air for fast, efficient removal of cuttings in rotary operation.

The LRD-3 comes complete with a hydraulically operated magazine with capacity for four 20 ft. drill pipes, and can be equipped with such optional equipment as lights for night-time operation, a mounted bit grinder, air hoist, breakout tongs, water injection system, etc. Specification Sheet AT-147 describes the unit in detail, with complete spec information. Send for a copy.



rotary or down-the-hole drilling . . . gas or diesel . . . on tracks or truck-mounted!

LE ROI

division of Westinghouse Air Brake Co. Sidney, Ohio

Dig and Haul for 8¢ Per Yd.

Sauerman Slackline Cableway excavating hard-to-dig flat rock from 70 ft. of water. Average hauls are 450 ft. to a surge pile which provides a ready reserve for processing. It also allows digging and hauling to continue when the plant or other equipment is down due to weather or other stoppage. Slacklines can dig from ground level to 125 ft. below water, operate over spans up to 1000 ft. Costs from pit to pile average about 8¢ per yd. including labor, power and maintenance.

Sauerman DragScraper working a bank deposit on a span of 300 ft. from bank to hopper. Rapid-shifting tail assembly located on bank is remotely controlled by third drum of DragScraper hoist when a shift in the Crescent scraper's line of operation is required. One man, one machine, handles digging and hauling from deposit to hopper—supplies material needs at this modern sand and gravel plant.

Sauerman Machines . . . work high banks . . . deep pits . . . or under water. In most cases, one operator handles digging and hauling from excavation point to hopper or surge pile. Controls can be remotely located for maximum visibility of material and plant.

Request recommendations on your material handling job. Ask for Catalog A for information on Drag-Scrapers in sizes to 15 yds. and Catalog C for information on Slackline Cableways in sizes to 3½ yds.

SAUERMAN BROS., INC. 630 SO. 28th AVE. BELLWOOD, ILL.
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Tautline Cableways • Duralite Blocks

Enter 1253 on Reader Card

Industry News

continued from page 68

Peerless employes share profits and losses alike

Since 1936, employes of Peerless Cement Co., Detroit, Mich., have participated in both the financial upswings and downswings of their company's business. Over the 24 years the profit-sharing program has been in effect, employes have taken home more than $8 million. But if Peerless should run in the red, the equivalent share in net loss would be figured and applied against the compensation fund. For the last seven years, however, the fund has been awarded amounts from $634,401 to $780,581 from net profits of $1,911,112 to $2,372,496.

Seniority and base pay come into consideration when determining an individual's share, and President Robert J. Morrison insists that the money is paid out as earned shares rather than bonuses. The system is also effective in reducing turnover.

Wisconsin gravel plant

A $400,000 sand and gravel and ready-mix concrete plant, the Four Lakes Fuel and Supply Co., was recently opened in Madison Wis. It is a subsidiary of Janesville Sand & Gravel Co., which will provide it with raw material from its Rock County pits shipped by rail. Highly automated, the new plant can produce 21 different sand and gravel mixtures.

What's ahead in 1962?

Is the outlook for the rock products industry rosy or gloomy? The next issue of Rock Products will bring you a consensus of the leaders of the industry

Enter 1254 on Reader Card

NOW THERE ARE FOUR "HDP" PRIMERS

to help you break more rock per shift

Now you can get **all** the economy of non-cap-sensitive blasting agents.

With the introduction of the HDP-5, you now have a complete "family" of Du Pont high Detonation Pressure Primers, especially created to develop full rock-breaking power from lower-priced blasting agents such as nitro-carbo-nitrates, Du Pont "Tovex" water compatible slurry, and prill/oil mixtures.

All four "HDP" Primers contain a high-density explosive which develops a velocity of almost 5 miles/second and a temperature of about 7500°F. This combination gives the very high detonation pressure to develop full energy from non-cap-sensitive products.

There's no nitroglycerin in "HDP" Primers, so they are less sensitive to shock and friction than dynamite primers. There's no headache causing ingredient.

And assembly to "Primacord" or caps is easy to make, through holes in the primers. You can even do it with heavy work gloves on.

Your Du Pont explosives representative or distributor can arrange for you to try out new "HDP" Primers now. Call him for details. Or for a copy of our new bulletin on the subject, write Du Pont, 2446 Nemours Building, Wilmington 98, Delaware. **EXPLOSIVES**

Meet the "HDP" Primer Family

HDP-1

PROPERTIES: Weight 1 lb. • Detonation Velocity 24,000 fps • Highly resistant to water and oil • Dimensions—3" diameter cylinder 2½" long • Two axial holes—1 for "Primacord" and 1 for electric blasting caps or MS delay electric blasting caps • Packed 48 primers per case—48 lbs. net

USE: Recommended for priming all NCN products, "TOVEX" gel, and prill/oil mixtures, bulk loaded or cartridged, in holes of 4" diameter and larger.

HDP-2

PROPERTIES: Weight ½ lb. • Detonation Velocity 24,000 fps • Highly resistant to water and oil • Dimensions—3" diameter cylinder 1.4" long • Two axial holes sized for use with "Primacord" only • Packed 100 primers per case—50 lbs. net

USE: Satisfactory for priming bulk loaded NCN products and prill/oil mixtures in holes of 4" diameter and larger.

HDP-3

PROPERTIES: Weight ½ lb. • Detonation Velocity 24,000 fps • Highly resistant to water and oil • Dimensions—1¾" diameter cylinder 3½" long • Single axial hole centered in the primer sized for "Primacord", electric blasting caps and MS delay electric blasting caps • Packed 150 primers per case—50 lbs. net

USE: Recommended for priming all bulk NCN products, "TOVEX" gel, and prill/oil mixtures in holes ranging from 2" to 4" inclusive in diameter.

HDP-5

PROPERTIES: Weight 5 lbs. • Detonation Velocity 24,000 fps • Highly resistant to water and oil • Dimensions—5¼" diameter cylinder 4¼" long • Two axial holes sized for use with "Primacord" only • Packed 12 primers per case—60 lbs. net

USE: Recommended for priming all NCN products, "Tovex" gels and prill/oil mixtures, bulk loaded or cartridged in holes of 6" diameter and larger, under exceptionally severe conditions.

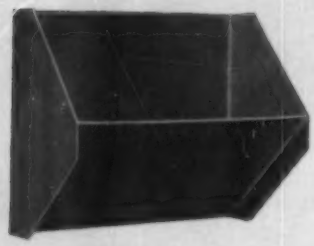
Better Things for Better Living ... *through Chemistry*

DU PONT

Conveying Costs got You over a bucket?

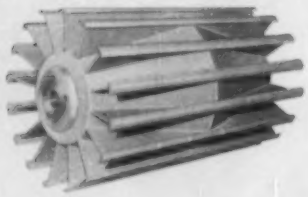
Swing to STANDARD METAL

Elevating and Conveying Equipment



CONTINUOUS ELEVATOR BUCKET STYLE NO. 2.

Styles include Salem, Style "A" and other continuous style buckets.



WING-TYPE SELF-CLEANING PULLEY.

Dodge Taper-Lock® Hubs and Bushings Standard. Available also with solid hubs bored to specifications.

DUPLEX BIN GATE.

Single Bin Gates also available.

WRITE FOR CATALOG SHOWING THE COMPLETE STANDARD LINE.

SM17

STANDARD METAL MFG. CO.

111 CENTER ST. ● MALINTA, OHIO

Enter 1284 on Reader Card

CALENDAR

of coming events

1962

January 10-12, 1962—Texas Ready Mixed Concrete Association, 4th Annual Short Course, Texas A & M College, College Station, Texas

January 15-19, 1962—National Limestone Institute, Inc., Meetings, Roney Plaza Hotel, Miami Beach, Fla.

January 28-Feb. 1, 1962—Associated Equipment Distributors, 43rd Annual Meeting, Conrad Hilton Hotel, Chicago

February 5-9, 1962—American Society for Testing Materials, Committee Week, Sheraton-Dallas and Statler-Hilton Hotels, Dallas, Texas

February 5-9, 1962—National Sand and Gravel Association —National Ready Mixed Concrete Association, 32nd Annual Convention and Biennial Show, McCormick Place Exposition Center and Conrad Hilton Hotel, Chicago, Iil.

February 11-15, 1962—National Crushed Stone Association, Annual Meeting & Exhibition, Conrad Hilton Hotel, Chicago, Ill.

February 18-22, 1962—American Institute of Mining Engineers, 91st Annual Meeting, Statler Hotel, N.Y.C.

March 26-27, 1962—Indiana Mineral Aggregates Association, Claypool Hotel, Indianapolis, Ind.

April 3-5, 1962—American Institute of Electrical Engineers, Cement Industry Technical Conference, Chase Hotel, St. Louis, Mo.

April 5-7, 1962—American Society of Civil Engineers, Pacific Southwest Council Convention, El Cortez Hotel, San Diego, Calif.

April 12-14, 1962—Pacific Southwest Minerals Industry Conference (AIME), Palace Hotel, San Francisco, Calif.

May 3-5, 1962—Fifth Rock Mechanics Symposium, jointly sponsored by the mining departments of Colorado School of Mines, Missouri School of Mines and Metallurgy, Pennsylvania State University and University of Minnesota; held at University of Minnesota Institute of Technology, Minneapolis, Minn.

June 18-21, 1962—National Limestone Institute, 17th Annual Convention, Statler-Hilton Hotel, Washington, D.C.

CUT COSTS *LESS DOWN TIME AND UP-KEEP*

GIORDANO BROS. of MARKHAM, ONTARIO operate this diesel-electric Telsmith 367 Portable closed circuit crushing-screening plant. Plant mounted 60 KW Generator powers individual electric motors on conveyors and screen; simple push-button control—cut power and up-keep costs. (*Below, lower left*) Control cabinet with 3 receptacles for powering stock piling conveyors.

...get HIGH CAPACITY crushing and PRODUCT FLEXIBILITY

Crushing over 215,000 tons of granular road building material in two years, this Telsmith Portable closed circuit crushing-screening plant has had practically no down time; its single 367-S Gyrasphere Crusher still has its original manganese steel liners. ● Plant capacity is high—up to 300 tph. ● Its 367 Gyrasphere has a big ratio of reduction—7″ feed down to ⅝″, with little oversize. ● The big 4-bearing, 4′ x 12′, 2½ deck Vibrating Screen can make 3 product sizes in one pass. Sizes may be blended by simple adjustment of under screen gates. ● Crusher; Screen; 30″ conveyors, adjustable stroke Plate Feeder; Feed Hopper with removable grizzly; non-slip 84″ x 24″ Rotary Elevator—*all Telsmith heavy duty* units, the same as used in permanent plants to insure the low cost, profitable service today's commercial producers demand. For full details, get illustrated Bulletin 276. P-24-161

SMITH ENGINEERING WORKS

508 E. CAPITOL DRIVE, MILWAUKEE 1, WISCONSIN / DIVISION OF Barber-Greene

Cable Address: Songworks, Milwaukee • Representatives in Principal Cities in all Parts of the World

Enter 1227 on Reader Card

Union Wire Rope

When the going gets tough-- **Tuffy** gets going,

Victim of the Bends

Excessive bending of wire rope accelerates wear. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union Wire Rope engineers have compiled data that you can use to assure getting the rope construction that will give you the longest service life. Ask about it.

Kick Out Worn Sheaves

Old sheaves may never die, but in "fading away" they develop conditions which shorten rope life. Sheaves with grooves corrugated with rope lay impressions should be replaced with new ones before new wire rope is installed.

Union Tuffy's on these jobs give you the ultimate low cost.

Tuffy Scraper Rope

Flexible enough to take sharp bends; stiff enough to resist looping and kinking when slack; highly resistant to the shock of load impact — that's Tuffy balanced construction. Mount a reel on your scraper—save wasting sound rope.

Tuffy Slings and Hoist Lines

Slings are a patented, 9-part machine-braided wire fabric that is next to impossible to knot or kink. Hoist lines have built-in strength, toughness, flexibility. Balanced—a top-performing team for handling every type of material. In addition to Tuffy, Union Wire Rope furnishes a complete line of slings.

Tuffy Dozer Rope

Mounts right on your dozer in a 150′ reel. When rope shows wear, just feed through enough to replace the damaged part. Saves rope, gives you a bonus of extra service. Also available in 300′ and 500′ reels.

The Union Wire Rope Organization Gives You . . . RIGHT-NOW service with the RIGHT rope. Get set for quick action. Vast Union Wire Rope facilities assure fast delivery of just the wire rope or sling you need. More than 1600 standard constructions are available *plus* the famous Tuffy family of ropes and slings tailored to special needs. Hundreds of distributors and 15 strategically located warehouses help you meet emergencies—cut wasteful down-time. Call your Union distributor. He's listed in the phone book Yellow Pages.

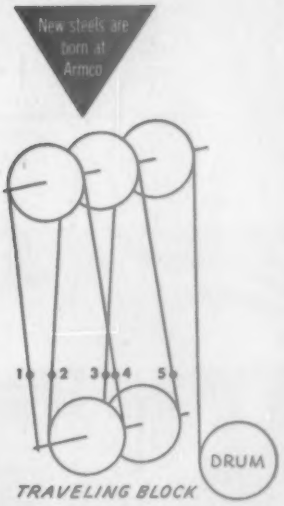
Tuffy Tips

and keeps going longer if not abused

Diameter of Rope	Min. Dia.	Max. Dia.
1/4 - 5/16	+ 1/64"	+ 1/32"
3/8 - 3/4	+ 1/32"	+ 1/16"
7/8 - 1 1/8	+ 3/64"	+ 3/32"
1 1/4 - 1 1/2	+ 1/16"	+ 1/8"
1 5/8 - 2 1/4	+ 3/32"	+ 3/16"
2 3/8 and larger	+ 1/8"	+ 1/4"

Recommended groove sizes:

New ropes are usually over-size. It is advisable to have groove diameters of sheaves or drums as large as the actual calipered diameter of the new rope, or slightly larger. We recommend sizes as (above) charted.



How to Figure Reeving Loads

Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves.

To count the number of parts supporting the load, draw an imaginary line across the parts of the rope supporting the load.

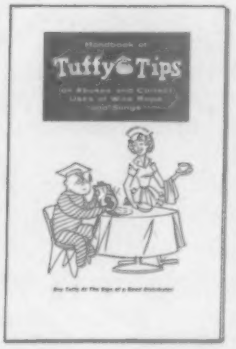
The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

Tuffy Dragline Rope

High abrasive resistance and super flexibility. Gives long service, dependable action in handling any material—wet or dry dirt, sand, gravel, rock, minerals. Rides smoothly on grooves—hugs the drum when casting for full load.

Union's Handbook of TUFFY TIPS—Free!

The "Tuffy Tips" shown here are quoted right out of Union Wire Rope's handbook. In it there are dozens of other priceless hints on the correct use of wire rope. The common abuses and how to avoid them. How to save costly injuries. Maintenance tips. The proper fittings and how to apply them. Recommended sizes. Many other facts and suggestions that will cut down your rope costs and help you get out of wire rope the full service we build into it. No charge. Write Union Wire Rope, Armco Steel Corporation, 2156 Manchester Avenue, Kansas City 26, Missouri.



4-61

ARMCO Union Wire Rope

Enter 1235 on Reader Card

HINTS & HELPS

Profit-making ideas developed by operating men

Dewatering problem solved and settled

Fortunately, not many crushed stone producers have the same problem that this one had: How to recover water from the quarry where the water level was some 40 ft. below the top of a nearly sheer wall.

Solution proved to be a vertical turbine pump that was cantilevered out from the wall with the intake pipe extended down from the platform to well below the surface of the water. The pump handles 3,000 gpm. to a pond about 300 ft. away and is driven by a 75-hp. electric motor.

Fire fighting practice

After our previous comments about the hazards of fire in rock products plants an asbestos producer sent a copy of his house organ devoted to fire prevention. Even though asbestos can't burn, the equipment used to mine and process it can—and does.

This particular plant has a fire marshall whose prime responsibility is to make sure that the whole plant's personnel is mobilized to fight fire. This takes the form of making sure that all welding equipment is equipped with extinguishers that really work and that workers actually are skilled in operating them. In addition, one man in each department on each shift receives modern training methods.

In addition to the routine good housekeeping checks, fire fighting indoctrination includes regular practice at putting out an actual fire with each of the several kinds of equipment available.

END

Jeep-drawn trailer waters haul roads in Texas

When a Texas producer found it necessary to water haul roads only occasionally, he rigged up a tank wagon by mounting a tank on a trailer and pulling it with a Jeep or pickup truck. The tank can easily be removed and the trailer used to haul material. Or the entire rig can be unhooked and the Jeep used to transport personnel around the plant.

Harry Hess, Houston 33, Texas

You won't find any squares in the Coates Triple-Forged Carbex Grinding Ball gang. They are all perfectly round to give you better, longer lasting milling surfaces. Coates patented a process for the first round Grinding Ball back in 1918 and has kept a high standard of roundness ever since.

Coates Carbex Grinding Balls are carefully made with great skill and care from special high-carbon steel. Triple-forged into perfect spheres, heat treated for hardness, yet toughened to the core to withstand milling strains.

Today's Coates Carbex Grinding Balls have proven by actual production run tests to be your best buy. Yet, Coates sponsors continuing research to find ways of making even better grinding balls.

Call for Coates Triple-Forged Grinding Balls . . . built with care for longer wear.

Write for prices . . . All sizes — ½" to 5" carried in stock for immediate shipment.

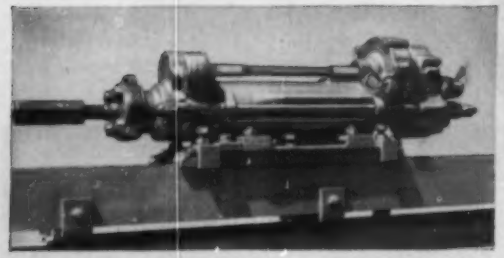
COATES

STEEL PRODUCTS COMPANY
GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

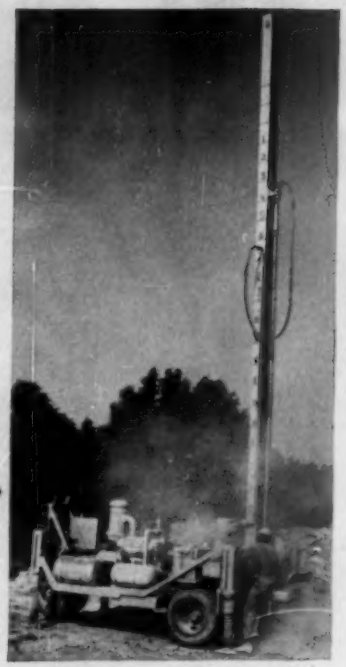
Enter 1230 on Reader Card

GARDNER-DENVER quarry equipment



NEW PR123 POWER-ROTATION ROCK DRILL
Provides absolute control—new Gardner-Denver PR123 has independent rotation control . . . variable forward speed, variable reverse speed, plus neutral position. Now driller can select right combination of rotation, drill impact, feed pressure and hole blowing for fastest penetration in any type of rock.

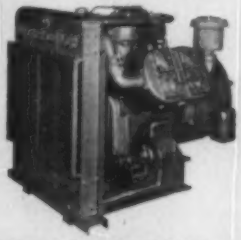
NEW ZEPHYR ROTARY BLAST-HOLE RIG. For fastest drag bit operations—the new Zephyr is a self-propelled, self-contained rig designed for one-man operation. It features 10,000 lbs. pull-down pressure on bit, instantaneous travel control, heavy-duty rotary table with four speed options; and a 200 cfm air package. Track and wheel models. Hole sizes from 1¾" to 4½".



SWING-BOOM "AIR TRAC"®
Most versatile crawler drill available—boom swings in arc of 11'10" . . . reaches 2½' over both sides of tracks. For horizontal holes, mast reaches 9'6" above floor. Swing-boom "Air Trac" is self-equalizing, self-stabilizing . . . moves quickly and easily over rough, rocky terrain. Drill rod change to 20'.

"MOLE-DRIL"*
Percussion drill for rotary rigs—"Mole-Dril" cuts big bore hole in hardest formations quickly. Drill follows bit down through rock, screws on end of drill pipe.

*T. M.



W-TYPE COMPRESSORS. A water-cooled work horse—here's a stationary compressor that installs easily, runs smoothly and requires little maintenance. Models in capacities from 143 to 1395 cfm.

BROACHING DRILLS. Three heavy-duty models—have interchangeable chucks for drilling and broaching. Drill wet or dry. Feeds available from 7'2" to 13'4". Mounting slide provided with gibs and removable shims.

BREAKERS
Rugged, hit hard—a size and weight for every requirement.

BIT GRINDERS
Fast, efficient—sharpen full range of cross and X-type bits.

AIR FEED LEG DRILLS
Lightweight, easy to use—two bore sizes, 2½" and 2⅝".

DRIFTERS
Automatic and continuous-feed models—bore sizes from 2¾" to 4". Deep hole drills available in bore sizes of 4", 4½" and 5½".

SINKER DRILLS
Speed secondary breakage—five models, 2⅜" to 2¾" bore.

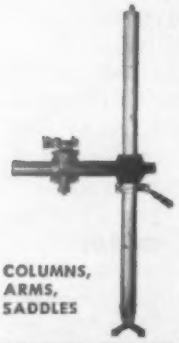
Enter 1229 on Reader Card

to help you produce more at less cost

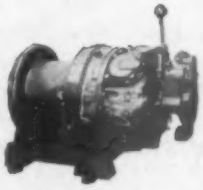
NEW ROTA-SCREW PORTABLE AIR COMPRESSORS. Reduce maintenance to a trifle—new-type rotary screw compressor has no touching parts in compressor chamber . . . no blades to inspect or replace. It delivers pulsation-free, compressed air flow almost instantly on start-up. Rota-Screw portables operate off level . . . operate in all weather, 40° below to 115° above zero. Three sizes: SP900, 900 cfm; SP600, 600 cfm; SP125, 125 cfm.

NEW HI-LEED DRILL STEEL. Never before drill steel like this—HI-LEED steel is designed to always uncouple by hand. It combines field-proven reverse buttress design with entirely new thread form that eliminates the wrench.

HT143 CRAWLER ROCK DRILL. Takes a rod change to 30'—Gardner-Denver HT143 carries a hard-hitting, 5½"-deep hole drill on a heavy-duty drilling mast. It is self-propelled. All controls centralized for ease of operation.



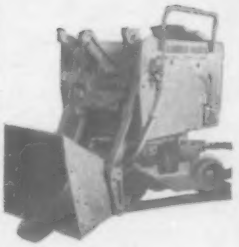
COLUMNS, ARMS, SADDLES



AIR HOISTS

SUMP PUMPS

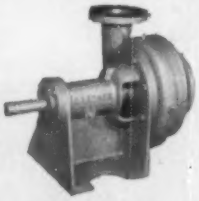
DRILL STEEL FORGES



MINE CAR LOADERS

IMPACT WRENCHES

AIR MOTORS



CENTRIFUGAL PUMPS

AIR LINE OILERS

DRILL FEEDS, BOOMS, POSITIONERS

Write for bulletins

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Ill.—Offices in principal U.S., Canadian and Mexican Cities
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario.

International: Gardner-Denver International Division, 233 Broadway, New York 7, N.Y.
Offices: Buenos Aires, Argentina; Artarmon, N.S.W. Australia; Brussels, Belgium; Rio de Janeiro, Brazil; Santiago, Chile; Barranquilla, Colombia; Lima, Peru; Ndola, N. Rhodesia; Salisbury, S. Rhodesia; Johannesburg, Transvaal

The Highway Program's ready to highball

Here's an exclusive interview with the Federal Highway Administrator as he predicts a clear track ahead for the Interstate Highway System

by Joseph N. Bell

Rex Whitton (right), federal highway administrator

UNCERTAINTY and economic backing-and-filling during the last six years have not prevented remarkable progress on the construction of the Interstate System. Finally it appears to be hitched behind a substantial financing vehicle and headed down a straight and relatively unobstructed track toward its scheduled completion.

This is the strain of optimism that prevailed throughout a recent exclusive interview granted ROCK PRODUCTS by Rex Whitton, Federal Highway Administrator, in his Washington office. Said Mr. Whitton: "Barring runaway inflation or some other drastic over-all economic change, I think present estimates and appropriations are adequate to complete the Interstate program on time."

Present estimates and appropriations are, of course, embodied in the new Federal Aid Highway Act, passed and signed into law this past summer. For the first time, after a decade of uncertainty, it would appear that rock producers can look forward to steady, predictable roadbuilding activity on the Interstate System under the new law.

These are the basic provisions of the Federal Aid Highway Act of 1961.

1. Total authorizations were increased by $11.5 billion, thus closing the gap between original inadequate estimates of the cost of completing the System and recent estimates officials believe to be accurate over the long pull.

2. Authorizations were provided for fiscal 1970 and 1971 (not previously covered by law), and the Highway Trust Fund was extended to Oct. 1, 1972.

3. Cost estimates as of January 1961 were established as the basis for state allocations for the remainder of the Interstate System construction program.

4. Beginning in 1963, authorizations will increase yearly over previous estimates, finally peaking at $3 billion annually in 1968-70. Increases will range from $400 million in 1964 to $1.5 billion in 1968, thus providing a certain and steadily increasing market for the rock industries in the decade ahead.

5. Funds to carry out this financing program will be drawn from: higher taxes on tires, inner tubes and tread rubber; larger tax levies against trucks with a taxable gross weight in excess of 26,000 lb. (which taxes may now be paid on an installment basis as outlined in the new law); continuation of the "temporary" 4¢ per gallon tax on both gasoline and diesel fuel (except when used for nonfuel purposes as a raw material in the production of something else); transfer from general funds to the Interstate System Highway Trust Fund of all the 10 percent excise tax on trucks, buses and trailers; under previous law only half of this tax was transferred to the Highway Trust Fund.

The Federal Aid Highway Act of 1961 confined itself to the Interstate System and did not deal with programs for other Federal aid state primary and secondary road systems. Authorizations for these roads for fiscal 1964 and 1965 will be taken up by Congress next year. If increases recommended by the Kennedy Administration are followed, the result will be a total Federal aid highway construction package of some $5 billion per year for at least the next decade including state matching funds.

The keynote of the new legislation—at least as it is reflected by the upper echelon people who will administer the building of the Interstate System—appears to be optimism, stability and consistency. On this point, Mr. Whitton said: "I think that construction costs have stabilized. I have no

Please turn page

as he discussed his optimistic outlook with the author . . .

Ready to highball . . .

continued from page 81

information to lead me to believe that there will be any shutting off of the Interstate program according to the nature or needs of the economy."

Present legislation calls for completion of the program by 1972, and Federal highway officials appear confident that this schedule can be met. Mr. Whitton's views are typical of the pervasive feeling of confidence and sure-footedness. Standing behind his desk in his Washington office, jabbing his finger emphatically at a map showing progress on the Interstate System—a map which is permanently ensconced under glass on his desk top—Mr. Whitton said: "There is nothing barring the way, now, to steady progress toward the goal of completion of the Interstate System on schedule. We've been provided the tools we need to get the job done. Now we intend to do it—as effectively and expeditiously as we know how."

Following are verbatim highlights of the ROCK PRODUCTS interview with Mr. Whitton:

Interview with Rex Whitton, Federal Highway Administrator

Q. What do you think of the new Federal Aid Highway Act?

A. I have every conviction that the legislation will effectively complete the Interstate System.

Q. Did the financing plan finally settled on tie in with the findings of the studies made by the Bureau of Public Roads?

A. The financing arrangements finally arrived at were certainly influenced by the BPR studies. The results of the fourth study weren't final, but data on hand permitted sound estimates and these were the basis of the new financing arrived at by the Ways & Means Committee.

Q. What if costs skyrocket again? Will the Interstate Program be back in the same financial muddle?

A. I think construction costs have been pretty well stabilized. Our 1958 and 1960 projected costs were almost identical. Therefore, barring runaway inflation or some other drastic over-all economic change, I think present estimates and appropriations are adequate to complete the Interstate program on time.

Q. Under the heading of "drastic over-all economic change," is it conceivable to you that the highway program—and particularly the Interstate System—will be used as an economic valve to prime or restrain the economy? This is probably our largest single public construction program. Can the people in the rock industries expect a continuity in it, or will it be subject to national economic manipulations?

A. I have no information to lead me to believe that there will be any shutting off of the Interstate program according to the nature or needs of the economy. I have no indication that the highway program will be used in any such way. It simply couldn't be built economically or efficiently on such a stop-and-go basis. Now, of course, someone above me can decide differently on this point—can decide that the needs of the whole economy are more urgent than the immediate needs of the

highway program—but I have no indication that the Interstate program will be used in any such manner.

Q. How about the states? Will the time and place of construction be governed by the need to plug economic holes?

A. Of course the highway program can be used by the individual states to shore up regional problems, but that is the state's responsibility and not mine.

Q. Did the long deliberation and delay in Congress before providing new financing for the program slow down its construction materially?

A. Yes, there was a slowdown in construction in 1960 and 1961. There had to be because a number of states had come to a halt awaiting new Federal appropriations. Without the new bill, expenditures for 1962 would have been only $1.6 billion, since the 4¢ gas tax would have expired—even though the authorized apportionment was $2.2 billion. However, the Interstate apportionment for fiscal 1964 under the new bill will be about $2.6 billion.

Q. How about expenditures for this year?

A. In 1961, we were supposed to expend $2.2 billion on the Interstate System. The actual figure will be in the neighborhood of $2 billion, because of the slowdown awaiting new financing.

Q. What about maintenance? Isn't it going to come as quite a shock to some states when they have to start spending heavy maintenance money on these plush roads?

A. The states have been quite aware of the maintenance burden of the Interstate System for a long time. When I was Chief Highway Engineer in Missouri, I was chairman of a committee of state highway officials that studied this problem as long as six years ago. So this will come as no surprise to the states, and I think they are prepared for it.

Q. But it will still be a heavy financial burden for the states, will it not?

A. Actually it is not a burden when viewed in broad perspective because the maintenance cost per vehicle mile on these high-type roads will probably be smaller than any other highways in the system of the state. By the same token, the cost/mile of constructing these highways—based on a vehicle-per-mile rate—is economical.

Q. What happens if the states become either unwilling or unable to maintain such highways properly by your standards?

A. At the moment, I anticipate no trouble with the states in carrying the full maintenance burden of the Interstate System. If they don't maintain these roads properly, we have the power to step in, do it, and then deduct the cost from their Federal aid funds. But, I repeat, I most emphatically do not expect this to happen.

Q. Is the Interstate System still under frequent attack as an unnecessary manifestation of the affluent society?

A. I no longer hear very many complaints about gold-plated roads. There was a lot of this when we first announced this System, and people were shocked with the idea of million-dollar-a-mile roads. Now they've had a chance to see them in operation, and we no longer hear this complaint. I've never yet had a man come to me and tell me that the road running past his house was too good.

Q. How do you account for this apparent change in attitude?

A. Two tremendous assets of the Interstate System—the lives being saved by these roads and the money being saved motorists and truckers through more efficient operation of their vehicles—were too generally overlooked when the program was first being presented to the public. Now that some of the roads are actually in operation, these two benefits are clearly apparent and have brought about a profound difference in public attitudes toward the Interstate program. We now have strong support for the two most expensive construction operations we perform: the provision of divided lanes and controlled access. Why? Because it has been demonstrated that they are saving thousands of lives and preventing hundreds of thousands of injuries while providing convenience and efficiency.

Q. How does the immediate Federal aid road-building future look?

A. We will go ahead with the program just as rapidly as money is available. END

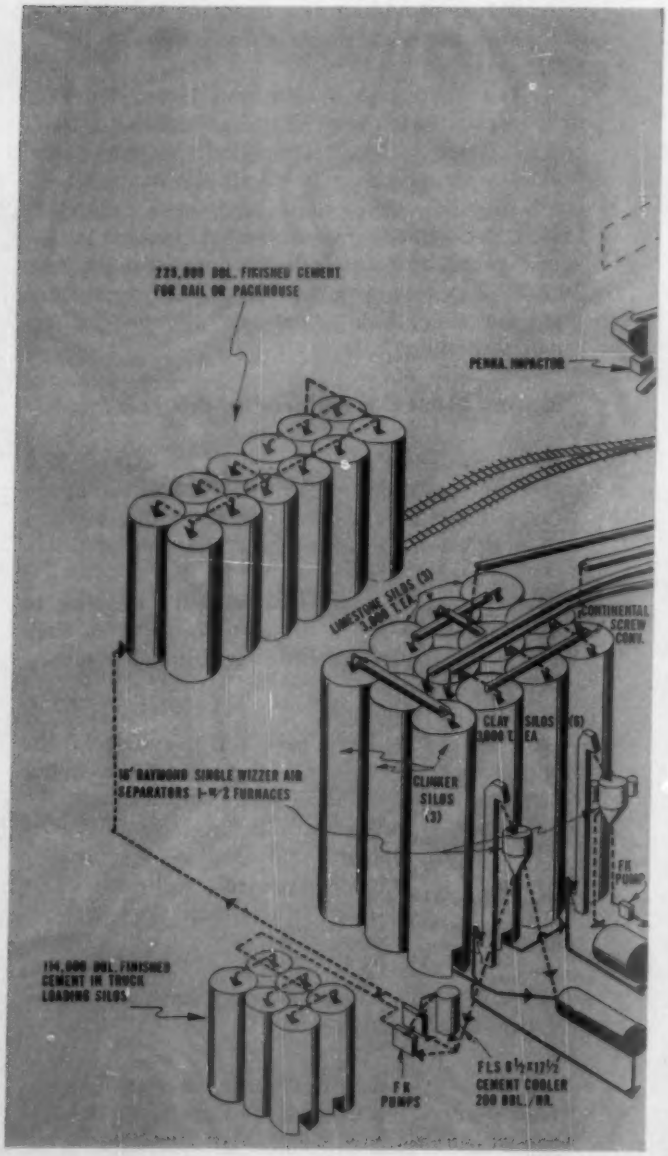
Conveyors speed raw material through new cement plant

Sophisticated materials handling systems reduce cost, step up efficiency of Northwestern States' Mason City show place

by Elwood Meschter

"SILO CITY" is the local nickname for the new dry process cement plant of Northwestern States Portland Cement Co. Thirty-five concrete storage silos plus some exceptional refinements in belt conveyor handling enable the company to turn out more than 1 million bbl. of cement with unusual efficiency.

Focus of the conveyor system is the group of twelve 3,000-ton silos that hold raw materials almost directly above the mills. This compact ar-

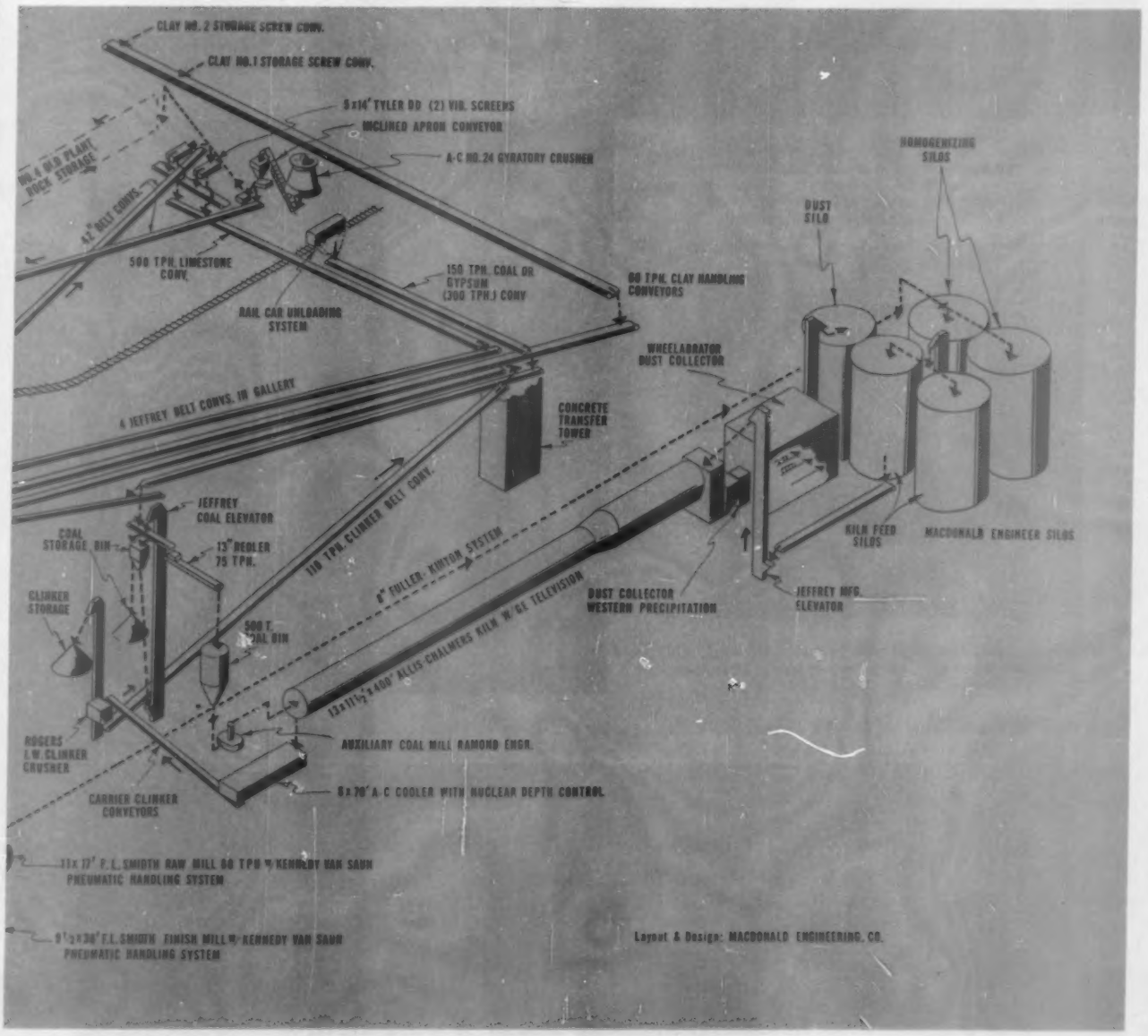

225,000 BBL. FINISHED CEMENT FOR RAIL OR PACKHOUSE
PENNA. IMPACTOR
LIMESTONE SILOS (3) 3,000 T. EA.
CONTINENTAL SCREW CONV.
CLAY SILOS (3) 3,000 T. EA.
16' RAYMOND SINGLE WHIZZER AIR SEPARATORS FOR 4-#2 FURNACES
CLINKER SILOS (3)
FK PUMP
114,000 BBL. FINISHED CEMENT IN TRUCK LOADING SILOS
FK PUMPS
FLS 8½x17½ CEMENT COOLER 200 BBL./HR.

rangement has proven to be much more flexible and efficient than the conventional storage hall, with its vast area under roof and relatively slower materials handling system.

Of course, a number of other innovations and design refinements contribute greatly to the new plant's low investment and operating economy. For one, the old plant on the same property is still operating and its redesigned limestone and clay handling systems are supplying the new plant with raw materials. Belt conveyors tie the two plants together. Quarry development was not necessary; only a couple of extra haulage trucks were needed to step up the flow of materials.

The new plant does not follow the trend toward centralized controls so evident in many other new cement plants. Control equipment is grouped together, but each control center is located right with the operating equipment. Thus, the clay handling system is controlled at the clay grinding

Please turn page


CLAY NO. 2 STORAGE SCREW CONV.
CLAY NO. 1 STORAGE SCREW CONV.
5'x14' TYLER DD (2) VIB. SCREENS
INCLINED APRON CONVEYOR
A-C NO. 24 GYRATORY CRUSHER
NO. 4 WET PLANT ROCK STORAGE
42" BELT CONVS.
500 TPH. LIMESTONE CONV.
150 TPH. COAL OR GYPSUM (300 TPH.) CONV
RAIL CAR UNLOADING SYSTEM
60 TPH. CLAY HANDLING CONVEYORS
HOMOGENIZING SILOS
DUST SILO
WHEELABRATOR DUST COLLECTOR
4 JEFFREY BELT CONVS. IN GALLERY
CONCRETE TRANSFER TOWER
JEFFREY COAL ELEVATOR
COAL STORAGE BIN
13" BEDLER 75 TPH.
110 TPH. CLINKER BELT CONV.
6" FULLER KINYON SYSTEM
KILN FEED SILOS
MACDONALD ENGINEER SILOS
CLINKER STORAGE
DUST COLLECTOR WESTERN PRECIPITATION
JEFFREY MFG. ELEVATOR
500 T. COAL BIN
12'x11½'x460' ALLIS CHALMERS KILN W/GE TELEVISION
ROGERS I.W. CLINKER CRUSHER
AUXILIARY COAL MILL RAMOND ENGR.
8'x70' A-C COOLER WITH NUCLEAR DEPTH CONTROL
CARRIER CLINKER CONVEYORS
11'x17' F.L. SMIDTH RAW MILL 80 TPH W/ KENNEDY VAN SAUN PNEUMATIC HANDLING SYSTEM
9'½'x30' F.L. SMIDTH FINISH MILL W/ KENNEDY VAN SAUN PNEUMATIC HANDLING SYSTEM
Layout & Design: MACDONALD ENGINEERING CO.

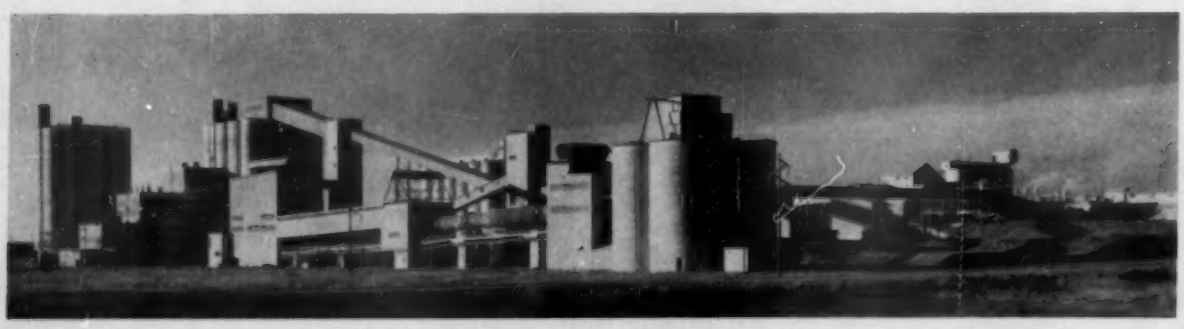
Left: Conveyors leap from towers to silos bringing raw materials to the new $6 million, 1½-million bbl. plant. Enough clay is stored during the summer to operate the mills for nearly six months of wet weather in the winter

Above: It takes nine big trucks to keep limestone moving through the belt conveyor system at better than 500 tons per hour

Right: An inclined apron conveyor of ancient vintage proved to be the most economical way of taking limestone from the bottom of the primary crusher to the new secondary crushing system

Above: All raw material passes through this 16-ft. air separator with its two integral furnaces before oversize goes to the mill far below

"Silo City" is the local name for this impressive array of silos and concrete structures at Mason City, Iowa



Conveyors speed raw materials . . .

continued from page 85

and drying center in the old plant, the limestone crushing system is controlled from a tower above the primary crusher and the coal and gypsum handling system is controlled from the rail car unloading hopper. The controls for materials handling conveyors, mills and the kiln are placed in the mill control room and kiln control room.

Kiln efficiency in the new dry process plant is greatly stepped up with a chain system in the kiln. This is apparently the very first time that a dry process kiln has been designed to be equipped with a chain section. The 11½ x 400-ft. kiln is belled out to 13 ft. diam. for the first 100 ft. of its length to compensate for the reduction in cross section and to keep gas velocity low through that part. Clinker is produced at slightly less than 900,000 Btu. per bbl., with natural gas firing and nuclear bed depth control in the 6 x 70-ft. clinker cooler.

When the plant is expanded the belt conveyor system will yield additional dividends. The conveyor system was designed to be flexible enough to handle the extra loads imposed by the addition of another kiln with more mills and additional storage capacity. In this way the extra capacity can be added without a proportional increase in capital investment.

Raw materials handling starts with the redesigned limestone crushing and screening setup in the old plant. With better than 500 tph. capacity, it can now handle the needs of both new and old systems. The existing primary gyratory crusher and the slow-moving inclined apron conveyor under it proved to have ample capacity, so they were left in place. The apron conveyor discharges into a small surge hopper and at this point the operator has the first opportunity to divert the flow between new and old systems. He has a second chance as the crushed limestone comes through the vibrating screens. In this way, the new system can prepare raw materials for the old plant.

An oscillating feeder puts the minus 5-in. limestone onto a 42-in. belt conveyor, first unit in the secondary crushing circuit. An impactor reduces the rock to minus ½ in. and another conveyor takes it to a pair of 5 x 14-ft. double-deck vibrating screens. Here the oversize is returned to the crushing circuit and the accepted material starts on its way by belt conveyor to one of the three 3,000-ton silos reserved for limestone.

The limestone conveyor is but one of four bringing raw materials to the top of the 12 silos, heart of the plant. A second belt conveyor rated at 60 tph. brings clay more than 1,000 ft. to the six silos reserved for it. A five-month supply of clay is crushed and dried during the summer when it is easiest to handle, and the winter's supply is stored in the silos.

A third belt conveyor system starts at a rail dump hopper where coal and gypsum are brought into the plant. When gypsum is handled it is put into one of the interstices in the silo. But coal is diverted to a 250-ton surge hopper or to a 500-ton storage bin above a coal mill at the firing end of the kiln.

The three conveyor systems handling raw materials parallel a conveyor system bringing clinker from the clinker cooler to the storage silos. The four belts join at a concrete transfer tower and continue on to the top of the silos. The kiln's clinker cooler discharges to a long, inclined oscillating conveyor whose last few feet are fitted with a slotted grating. This screen scalps off oversize clinker and drops it to a double roll clinker crusher. Crushed clinker joins the fine on an inclined belt leading to the transfer tower.

Extra flexibility has been designed into the coal system and the clinker handling setup that permits each material to be stored on the ground and reclaimed into the materials handling system. Fine or oversize clinker, either individually or together, may be diverted to a bucket elevator that builds a ground storage pile. This pile may be bulldozed back to the boot of the elevator and returned to the system.

Coal is handled in a similar way. Surge bin overflow is chuted to the ground and stored along with any coal received by truck. Then when space is available in one of the two coal bins, the coal is bulldozed to the elevator hopper and returned to the coal distribution system.

Conveyors are used extensively in the milling department, too. Raw materials are taken from feeders under the silos directly to an air separator. A weighing belt feeder draws material from each selected limestone silo, while a screw feeder draws clay from the selected silo and puts it on a weighing belt feeder.

The relative speed of these feeders is determined by the plant chemist according to the kind of cement to be made. Once set, the speeds are locked together. While the current drawn by the elevator lifting materials to the air separator con-

Please turn page

Conveyors speed raw materials . . .

continued from page 87

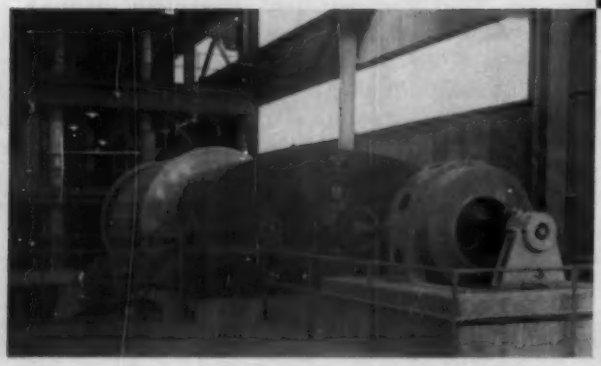
trols the rate of feed into the gathering belt system, the individual proportions remain fixed. Each clay feeder has a range between 3 to 15 tph., while each limestone feeder can handle between 20 and 60 tph.

Raw material is dried in the 16-ft. single whizzer air separator as the minus 200-mesh material is taken out. Oversize, both new feed and recycling, is dropped to the 11 x 17-ft. single compartment raw mill. Two gas fired furnaces are attached to the top of the separator, close to the incoming cement-making raw materials. This is an unconventional arrangement that has proved to be superior to having a furnace on the floor of the mill building, far below the separator. The hot exhaust gases from each of the two furnaces is diverted to the separator for drying raw materials. A pneumatic conveyor takes the mill discharge back to the boot of the raw material elevator for another pass through the separator.

The finish mill is operated in much the same way, except that the 9½ x 36-ft. 2-compartment mill takes the full flow of clinker and gypsum from the single gathering belt conveyor. Discharge from the mill is elevated to the air separator that, of course, does not have the drying furnaces. Here again, the load in the bucket elevator monitors the speed of the clinker weighing feeder which, in turn, is locked with a gypsum weighing feeder to maintain exact proportions of each.

Left: Each of the two homogenizing silos holds 2,650 tons of fine materials ahead of two 1,500-ton kiln feed silos. Silo at the right holds bag collector dust ready to be hauled away

Above: More than 100,000 bbl. of finished cement are available for truck shipment through these six concrete silos



Left: The 11 x 17-ft. single-compartment raw mill has a capacity of better than 60 tph. Finished material is sampled regularly as it goes back to the separator

Discharge from the separator above the finish mill is sampled continuously, just as the accepted material from the raw material separator is sampled and analyzed.

Finished cement is produced at a rate of nearly 200 bbl. an hour. When necessary, the cement is passed through a 6½ x 17-ft. high cement cooler, but more commonly it flows through an air conveyor system to one of two cement pumps. Either pump can put finished cement into the 6-silo truck loading station that holds about 150,000 bbl. of finished cement, but the rail loading system is supplied by only one pump. This group of 12 silos holds another 150,000 bbl. of finished cement and serves the pack house as well.

Cement-making raw materials are pumped from the raw mill directly to one of two homogenizing silos at the feed end of the kiln. Either of these 3,650-ton silos can deliver material to either of the two kiln feed silos. This is done through a level-box that feeds a bucket elevator.

However, the 1,500-ton kiln feed silos are arranged in series. This means that the No. 2 silo must discharge its contents to No. 1 silo before they can be delivered to the kiln feed system. This consists of a weighing feeder that puts material on a collecting belt between 37 and 55 tph.; this weighing feeder speed is synchronized to the kiln speed. A bucket elevator receives all new feed, and all materials collected in the kiln feed hood and the multiple cyclone collector. A screw conveyor transfers all material from the elevator to a kiln feed spout.

At the moment the company has no plans to put the micron-size baghouse dust into the kiln feed system. A large silo gathers this dust and it is hauled to waste periodically.

Exhaust gases from the big kiln are tempered by a water spray system. Three pipes inject water and the 1,100 deg. F. temperature is knocked down to the vicinity of about 550 deg. F.

The big 13 x 11½ x 400-ft. kiln may be coal fired or gas fired. Best firing conditions have been achieved with natural gas, but since this is supplied on an interruptable basis there is standby coal firing equipment. This consists of a 500-ton coal storage bin, a weighing feeder to put 10 tph. into a coal mill, and a system for bringing secondary air back to the mill.

Rated capacity of the kiln is 3,500 bbl. a day, but it is expected that it can easily reach 3,800 bbl. a day. Much of this surprising efficiency is attributed to the use of a chain system in the first 100 ft. at the feed end of the kiln. Chains are not unusual for wet-process kilns: This is probably the first dry process kiln designed especially for chains. The kiln was belled out to 13 ft. diam. at the chain section to maintain a constant gas velocity in the constricted area.

Discharge from the kiln goes to a 6 x 70-ft. horizontal grate cooler whose operation is controlled by a nuclear bed depth device. The kiln operator observes conditions in the kiln with a closed circuit television system that shows him the clinker just before it drops to the cooler. A radiation pyrometer tells him about heat conditions in the kiln, as does a thermocouple at the end of the chain section.

There is plenty of room for expansion at Mason City and the company confidently expects to take advantage of it. First part of the plan involves a second kiln, a new raw grinding mill and a new finish mill. The capacity of these mills with their auxiliary equipment should be adequate to take care of the needs of a third kiln without difficulty. Of course, another kiln feed silo will be required; new clinker and gypsum silos will complete the raw materials storage system. END

MAJOR EQUIPMENT REFERENCE

RAW MATERIAL SYSTEM:	
Quarry trucks, (7)	Euclid div. GMC
Quarry trucks, (2)	Mack Trucks, Inc.
Gyratory crusher	Allis-Chalmers Mfg. Co.
Car shaker	Allis-Chalmers Mfg. Co.
Vibrating feeder	Carrier Conveyor Corp.
Oscillating conveyors, (3)	Carrier Conveyor Corp.
Vibrating screens, 5 x 14-ft., (2)	The W. S. Tyler Mfg. Co.
Secondary crusher	Pennsylvania Crusher Div.
Conveyor belts	Goodyear Tire & Rubber Co.
Dust collectors, (25)	Northern Blower Co.
CEMENT MAKING SYSTEM:	
Weighing feeders, (10)	Merrick Scale Mfg. Co.
Bucket elevators, (7)	The Jeffrey Mfg. Co.
Conveyor idlers, pulleys, etc.	The Jeffrey Mfg. Co.
Coal mill	Raymond Div. Combustion Engr.
Air separators (2)	Raymond Div. Combustion Engr.
Raw mill, 11 x 17-ft.	F. L. Smidth & Co. Inc.
Finish mill, 9½ x 36-ft.	F. L. Smidth & Co. Inc.
Cement cooler, 6½ x 17-ft.	F. L. Smidth & Co. Inc.
Mill conveying systems, Airfloat	Kennedy Van Saun Engr. & Mfg. Corp.
Mill sampling systems	Kennedy Van Saun Engr. & Mfg. Corp.
Primary dust collector, kiln	Wheelabrator Corp.
Secondary dust collectors, kiln	Western Precipitation div.
Television system	General Electric Co.
Electrical equipment & motors	General Electric Co.
Clinker crusher	Rogers Iron Works Co.
Pneumatic conveying system	Fuller Co.
Screw conveyor system	Continental Conveyor & Equip. Co.
Truck loading scales, 100-ton, (2)	The Howe Scale Co.
Storage silos	Macdonald Engr. Co.
Homogenizing silos, (2)	Macdonald Engr. Co.
Kiln feed silos, (2)	Macdonald Engr. Co.
Dust silo	Macdonald Engr. Co.
Truck loading silos, (6)	Macdonald Engr. Co.
Rail loading silos, (12)	Macdonald Engr. Co.
Plant design & construction	Macdonald Engr. Co.

Last sand and gravel plant is completely portable—
ready to flee onrushing suburbs

It's the end of an era in Chicago

CHICAGO'S RESIDENTIAL SUBURBS are moving across the landscape. Sometimes they move slowly and irresistably; more often, they leapfrog from one rich farm to the next with incredible speed. But whether slow or fast, the tide of progress completely submerges extensive deposits of sand and gravel underlying much of Chicago's western suburbs.

Zoning restrictions seal off these aggregates so vital to the construction of streets, homes and industry. Often, raw materials must be hauled from distant suppliers to supplement the diminishing output of established producers in Cook and DuPage counties. These restrictions have been particularly onerous for the producers who have had the foresight to do prospecting and to obtain options to extract the sand and gravel. Many of these options have been taken years ahead of the developer and miles ahead of the spread of the new suburbs.

Elmhurst-Chicago Stone Co. is one of these progressive producers. They have opened what may well be the very last sand and gravel plant in the Chicago area. Now the company is working a 300 to 500-tph. sand and gravel plant near Bartlett, Ill. The site is right in the path of the onrushing developments and near a network of express highways.

The basic idea of the company was to put up a completely portable processing system—one that would not actually become "attached to real estate." This arrangement will let the company work the eastern end of the property for years. Then the portable plant will be transferred westward, still not stopping work in the rich gravel. Of course, this will give Elmhurst-Chicago the advantage of planning development of the property to maintain a minimum haul for its haulage trucks.

The problem of making the plant completely portable was resolved by the close cooperation of the company's design engineers with those of a

Please turn page

Above: Rich farm land gives way to progress as Elmhurst-Chicago extracts valuable sand and gravel to build the onrushing developments

Far left: The primary jaw crusher and scalping screen above it are mounted on a single portable structure

Left: Even the massive secondary crusher is poised securely on its portable structure

Right: Trucks dump into a hopper above a portable apron feeder

It's the end of an era . . .

continued from page 91

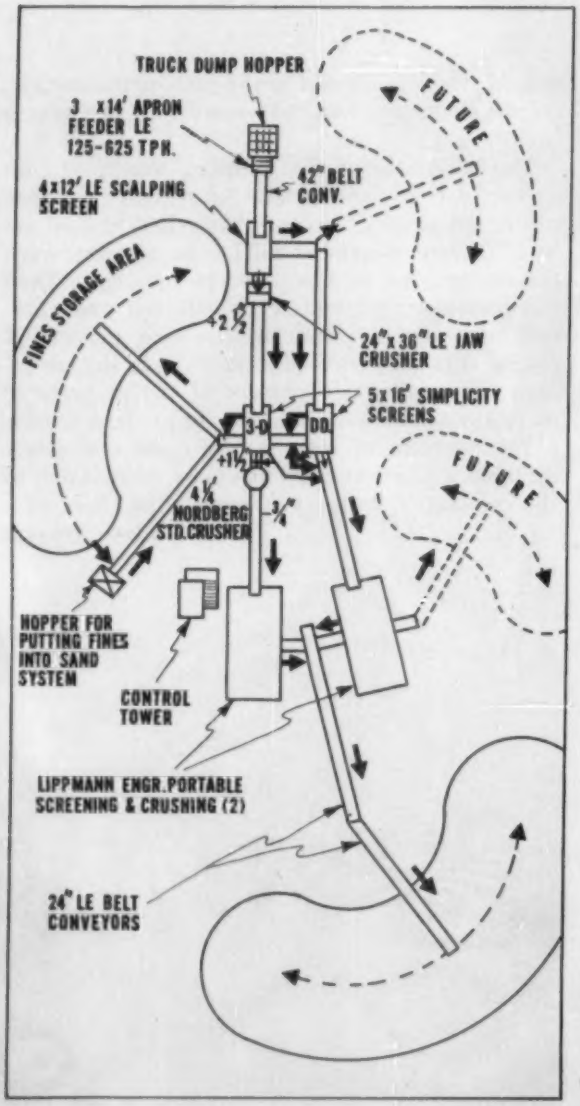
machinery manufacturer. The arrangement of equipment had to conform to Elmhurst-Chicago's design standards, but each individual piece had to be compact enough to be brought into the plant by truck or on its own wheels.

The solution was to make a careful layout, spotting heavy machinery on structural steel set in concrete slabs. Conveyors were to be made up in sections and the completed assemblies supported with light structural A-frames to concrete pads. Once the location of each piece had been determined, it was merely a matter of removing the wheels and axles from each traveling assembly and lifting it to its steel support.

With this careful preparation, installation time was only a fraction of that the company experienced on another sand and gravel plant of comparable size at Warrenville (ROCK PRODUCTS, April 1959, pp. 90-94). It took little more than three months to strip off overburden, pour concrete foundations, fit the machinery into place and start making aggregates.

The company makes ingenious and liberal use of stacking conveyors in this new plant. As in the Warrenville plant, the sand system is tied to the main part of the plant only with a radial stacker. But quite unusual for the gravel processing system is a parallel arrangement of conveyors and screens that starts at the primary scalping screen and ends in a portable crushing and screening unit.

This serves two purposes, (1) natural and crushed gravels may be made and stored simultaneously, and (2) natural gravels may be taken out of the flow of materials to reduce the volume of material going through the crushing circuit. This is the way the plant is now operating to make Illinois Grade 9 crushed gravel, a specification calling for 60 to 90 percent through ½ in. The products from the two portable plants are now combined and stockpiled together, but each could make two products if conveyors were in place to take them away.



Flexibility is characteristic of Elmhurst-Chicago's plants and this one is no exception. At least two places in the gravel system have been designated where future conveyors can remove and stockpile intermediate products and there are two places in the sand handling system where additional conveyors may be added.

There are a number of other, smaller design refinements that the company has found from long experience to be well worth the extra investment. Chief among these is complete access to all motors. Every stacker and conveyor has a sturdy walkway the full length. Screens have walkways on each side to make it easy to change screen cloths and to observe material on the top decks. Many individual units are connected by walkways.

A central control panel lets a single operator supervise the operation of the whole plant, from truck hopper to stockpile conveyors. Of course, there are individual switches at each major piece of machinery for safety.

Water control is another feature of the plant's arrangement. First cut into the gravel was to make a lagoon for washing water. Tailing water will be pumped to a settling pond at an elevation some 30 ft. above the water table. Seepage is expected to maintain the water level in the 20 ft. deep clear water pond.

Digging is done with a 1¾-cu. yd. shovel and dredging with a 1½-cu. yd. dragline to load three 15-ton haulage trucks. These trucks were used to build the first stockpile of material excavated from the pond and now keep raw gravel flowing to the plant.

The truck dump hopper is equipped with a 3½ x 14-ft. apron feeder mounted on its portable framework. With a 5 to 1 variable speed drive, this feeder can put between 125 and 675 tph. of sand and gravel into the plant. Actual production, of course, will depend on the amount of each finished product wanted and on the amount of crushing needed to make it from the raw material. A test run making Illinois No. 9 at the full capacity of the final conveyor called for about 518 tph. at the apron feeder.

Second unit in the processing system is a scalping screen and jaw crusher mounted on the same portable structure. The 4 x 12-ft. double-deck vibrating screen is supplied with a 42-in. belt conveyor from the feeder. Oversize from this screen goes to the crushing system while through-screen material is diverted to the parallel natural gravel setup.

A 24 x 36-in. primary jaw crusher takes oversize from either the top deck or both decks of the scalping screen and drops crushed gravel to an inclined belt conveyor leading to a horizontal vibrating screen. This 5 x 16-ft. three-deck screen is mounted on the same portable carriage as the 4¼-ft. standard cone crusher it supplies. The whole assembly is nested into a structural steel tower that also supports a horizontal vibrating screen in the parallel natural gravel processing system.

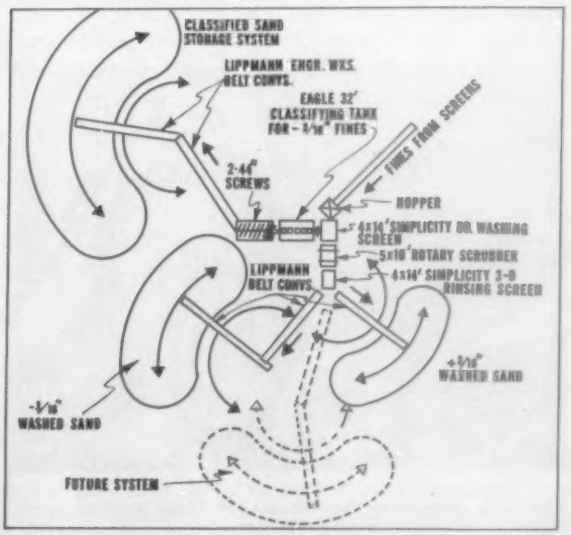
First provision for flexible arrangement in the future occurs at the scalping screen where the natural gravel is put into the parallel system. At this point a bifurcated transfer chute will divert part or all of the stream of natural, unwashed and unscreened gravel to an independent storage system. But for now, the whole flow of natural sand and gravel goes on to a 5 x 16-ft. double-deck horizontal screen.

The sand fraction is taken out of both parallel flows at this point where a short cross conveyor under both vibrating screens puts both natural and crushed sands on a radial stacker. This unit makes a large surge pile of fines or else puts them directly into the sand processing system. There is flexibility here also. An arrangement of chutes and gates permits the operator to divert large material over the lower deck of each screen to the sand system. Material over the middle deck of the three-decker in the crushed gravel circuit normally drops to a conveyor belt, but it can be diverted to the natural gravel system.

Oversize from this particular screen goes to the cone crusher mentioned above, and crushed gravel is picked up on a conveyor and taken to the portable screening and crushing unit, last in the system. This parallels another identical unit for handling natural gravel.

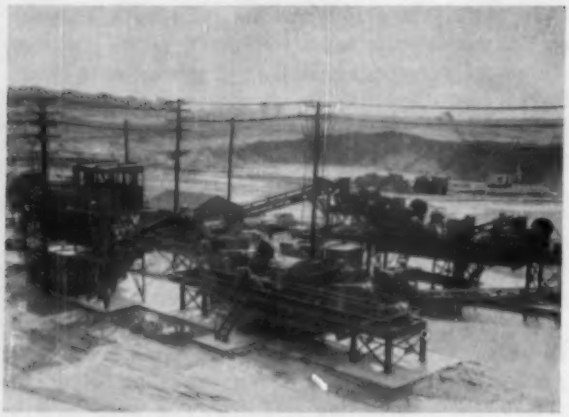
These are the manufacturer's standard units that have had wheels and axles removed and were then mounted on structural steel set in concrete. Each plant has three double-deck vibrating screens (two 4 x 10-ft. and one 4 x 14-ft. horizontal units), two 24 x 42-in. double roll crushers and a 24-in. rotary elevator. While each unit is now using only one discharge conveyor that puts all materials into a common distributing conveyor, it will be possible for each to make two products and to send them to individual storage piles. However, right now the entire production of gravel is concentrated to make a single big pile of Illinois No. 9 crushed gravel.

Please turn page



It's the end of an era . . .

continued from page 93



Two integral portable crushing and screening plants are part of the system. Like the other units, they are mounted on structural steel set in concrete

A portable scalping tank and screw classifier was brought to the plant as a trailer

The fines processing system makes three washed sands but can add two more products

The new plant is tooled up for washing and scrubbing its sand or fine gravel to make three products. Here again flexible design pays off with provisions to add two or more conveyor systems.

Fine sands are washed out of the flow of fines at a 4 x 14-ft. double-deck vibrating screen and dropped to a scalping tank. This unit with its two 44-in. screws is mounted on a single heavy portable frame. This 32-ton roadable unit is only 14 ft. high—10 ft. high when traveling. In operation it will make one product, a plus 100-mesh sand. However, it can be readily converted to make two products merely by adding an additional conveyor system and splitting the flow of material from the screw classifiers.

Coarse fines over the first screen drop to a 5 x 10-ft. drum to be tumbled and scrubbed, removing the last traces of any clay or slimes adhering to them. The drum delivers them to a final rinsing screen, a 4 x 14-ft. three deck unit. Tailings through this screen are sluiced to the tailings pond along with wastes from the scalping tank.

Normally the screen will make two products but eventually the coarse fines over the top deck will be conveyed to a storage system.

Preserving the idea of a completely portable system, the new plant does not have reclaim tunnels. All truck loading is now done with a rubber-tired front-end loader. **END**

MAJOR EQUIPMENT REFERENCE

GRAVEL PROCESSING:	
Trucks, 15-ton, (3)	Euclid Div. GMC
Dragline, 1½-cu. yd.	Marion Power Shovel Co.
Shovel, 1¾-cu. yd.	Marion Power Shovel Co.
Vibrating screens, 5 x 16-ft., (2)	Simplicity Engr. Co.
Apron feeder, 3½ x 14-ft.	Lippmann Engr. Co.
Vibrating screen scalper, 4 x 12-ft.	Lippmann Engr. Co.
Primary jaw crusher, 24 x 36-in.	Lippmann Engr. Co.
Belt conveyors & stackers, (10)	Lippmann Engr. Co.
Portable screening & crushing plants	Lippmann Engr. Co.
Layout & design	Lippmann Engr. Co.
Secondary cone crusher, 4¼ std.	Nordberg Mfg. Co.
Conveyor belts	Raybestos-Manhattan Inc.
Electric motors, (16)	The Louis Allis Co.
SAND PROCESSING:	
Vibrating screens, 4 x 14-ft., (2)	Simplicity Engr. Co.
Classifying tank, 10 x 32-ft.	Eagle Iron Works Co.
Dewatering screws, 44-in., (2)	Eagle Iron Works Co.
Rotary scrubber, 5 x 10-ft.	Lippmann Engr. Co.
Belt conveyors & stackers, (5)	Lippmann Engr. Co.
Plant layout & design	Lippmann Engr. Co.
Conveyor belts	Raybestos-Manhattan Inc.
Electric motors	The Louis Allis Co.
SHIPPING & MISC.:	
Front-end loader, Trojan	Yale & Towne Mfg. Co.
Shipping scale, 50-ton	The Howe Scale Co.
Road grader	Caterpillar Tractor Co.
Bulldozer	Caterpillar Tractor Co.
Bowl scraper	Caterpillar Tractor Co.

A full schedule of meetings and an imposing array of exhibits were on hand as the National Safety Congress & Exposition covered . . .

SAFETY FROM A TO Z

PLANT TOURS VIA SLIDES, plentiful case histories and a recurring theme of safety leading to economy and increased production were the vital ingredients of the National Safety Congress and Exposition, held in Chicago October 16-20.

That electricity is a potential killer everyone is aware. But electrical hazards continue to exist in almost every operation, often in such seemingly simple forms as faulty hand tools or knife switches. The first session of the Cement, Quarry & Mineral Aggregates Section was dominated by a symposium on electrical safety.

The physiology of electrical shock was described by E. J. Matousek, manager, General Engineering, International Minerals & Chemicals Corp., Skokie, Ill., in his plea for the adequate grounding of portable tools. In the future, manufacturers will probably insulate all metal or current-carrying exposed parts. With present equipment, however, the safest plan is to ground all these parts with a separate conductor, thereby providing a low-resistance path for the stray ground current. Frequent checking of all ground wires is an absolute must.

Quarry electrical equipment may carry up to 13,000 volts. In addition, operators of this machinery are often faced with difficulty in finding suitable grounds. H. P. Cassel, assistant superintendent—power, The Whitehall Cement Manufacturing Co., Cementon, Pa., defined a ground fault as occurring when a main power conductor accidentally touches the framework of the machine, with possible harmful or even lethal effects to anyone in contact. Since even the best insulation is subject to breakdown, the problem here is to control the intensity and duration when it happens. Mr. Cassel's recommendations for keeping the potential below the mining industry's 100-volt allowable maximum included resistance grounded neutral transformer distribution systems, with protective relaying installed in the neutral of the transformer that will be immediately responsive to ground fault currents and remove the entire feeder circuit from the system.

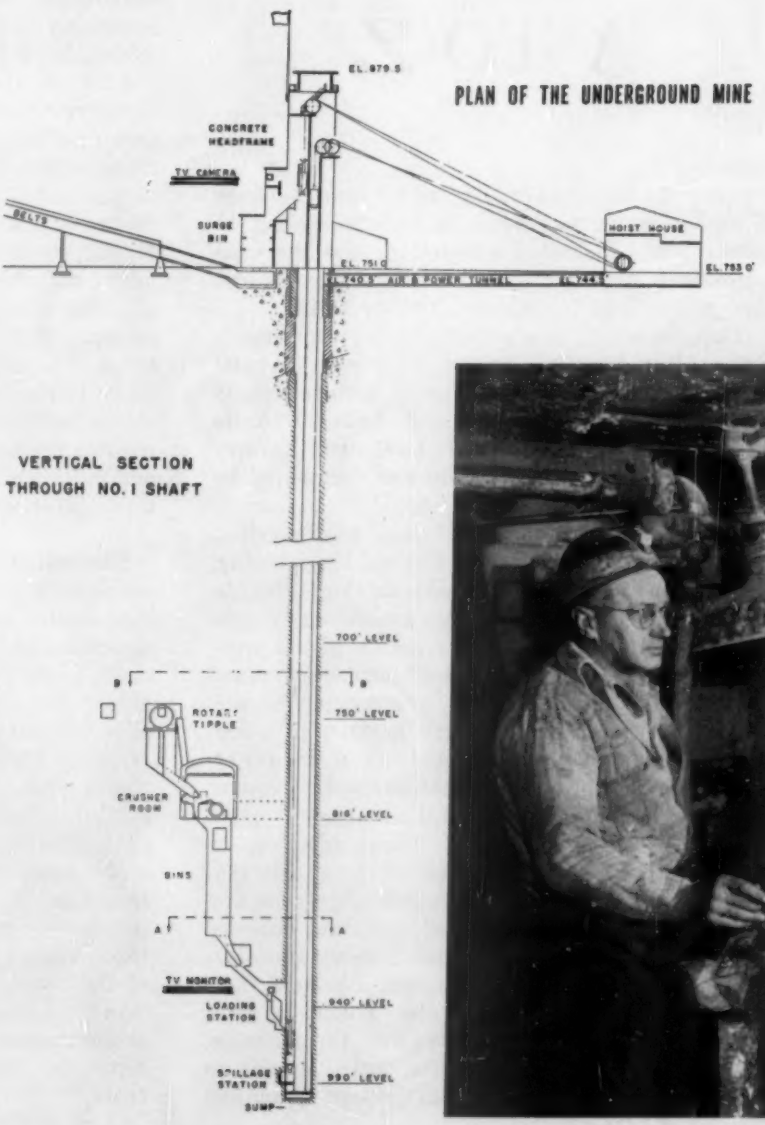
At U. S. Gypsum Co., according to Technical Manager—Electrical George J. Reynolds, knife-type "safety" switches have caused more electrical accidents than anything else. Too often they are intended only for visual purposes—to be opened or closed only with the power off. Too often violent electrical explosions have caused painful burns and permanent disability. This has led to a company decision to eliminate them wherever possible. It is replacing with molded case circuit breaker panels of adequate interrupting capacity all switches possessing the following hazardous characteristics: (a) underrated as to hp. requirements; (b) no snap or spring opening and closing action for knife blades; (c) no arc chutes, and (d) a non-interlocked cover.

The belt conveyor bogey was an important concern at the concluding Cement, Quarry & Mineral Aggregates session. "The tragedy of belt conveyor accidents is that we do know how to prevent them," said Leslie S. Voltz, safety engineer, Consumer Div., Vulcan Materials Co. In a dramatic slide sequence—"Death Takes a Holiday"—the audience accompanied an unfortunate laborer on a 220-ft. journey from screening building to load-out bins, traveling at 400 ft. per minute. In this particular instance, employes had had three separate opportunities to tag and/or lock out—but they hadn't. Additional case histories included permanent loss of the use of an arm, which cost the company $18,095, and two fatal accidents. All of these were avoidable and, the speaker stressed, "An organization whose management personnel are the most definitive disciplinarians generally have the best safety records and competitive costs."

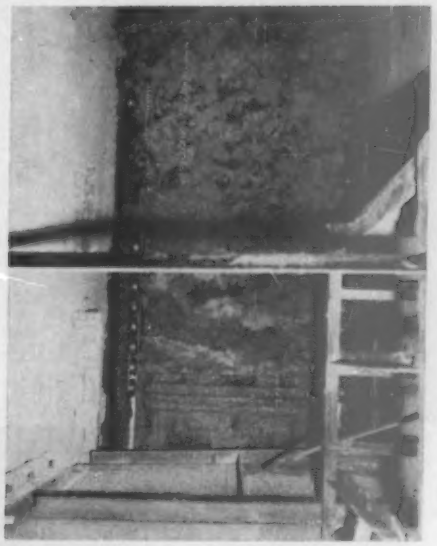
Please turn to page 116

TELEVISION GOES UNDERGROUND

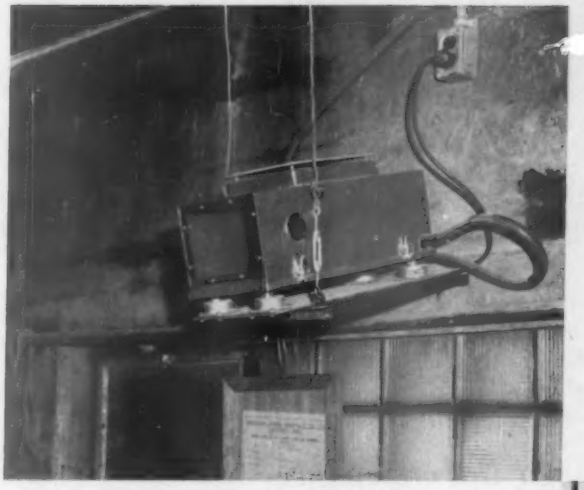
where it keeps an eye on operations at Canadian Johns-Manville's Jeffrey asbestos mine



Right: Plan of the Canadian Johns-Manville Jeffrey mine, Asbestos, Quebec. Notice the positions of the TV camera and the monitors



High moisture content in the asbestos ore can cause problems ranging from sticking to overloading. Thanks to the monitor, the skip tender can prevent costly production tie-ups and damage to the shaft



This camera is installed where it can "watch" the dumping process. The Pye Co. TV equipment consists of a camera 20 ft. in front of the two surface skip dumping locations, connected by 1,000 ft. of coaxial cable with a monitor at the 940-ft. level loading station

Closed-circuit television has been assisting the skip tenders for the past three years. Here, the camera control box and monitor in the surface lamp room get a thorough checking from a Pye Co. engineer. This equipment is used for adjusting the rest

Left: Progress of the two 12½-ton skips which carry underground ore to the surface can be easily seen in this monitor. The skip tender is responsible for operation of hoisting and lowering of the counterbalanced skips from the 940-ft. level. As one skip automatically releases its burden, the alternate is being filled from a measuring pocket

Plain talk on safety . . .

. . . or the lime industry at the crossroads

SAFETY WAS THE HIGHLIGHT of the operator's meeting of the National Lime Association in Washington. Managers of lime-making plants might take an even greater interest in safety if they knew the actual dollars and cents cost of accidents and injuries. Even the no-injury accident costs real money in lost production and damaged machinery.

The lime industry is obviously at the crossroads of safety. Having made tremendous strides from the catastrophic record of the war years, the lime industry should determine what it must do to improve its record. Improvements during the past few years have been negligible. To hold steady would be as unthinkable as to regress.

Kenneth A. Gutschick, manager of the Association's Technical Services, spelled out these costs

Top: It takes a lot of design know-how to build efficient kilns using natural gas, according to Victor J. Azbe. His paper at the National Lime Association meeting followed the presentation of the annual Azbe Award

Second from top: Trace elements in limestone or lime exert an influence far out of proportion to their concentration. This was the thesis of M. F. Goudge, noted geologist and Canadian consulting engineer

Second from bottom: Edward Tanski, of Mercer Lime & Stone Company, explained his company's research into the performance of refractories

Bottom: An ingenious mechanism for bottom discharge efficiency was detailed by John H. Carpenter, Denver consulting engineer

in detail in a notable analysis of lime plant injuries over the past 25 years. Many of the answers must lie in a careful evaluation of the kinds of accidents the industry is afflicted with—falls, burns and handling materials. Secondly, the concerted efforts of every producer should be enlisted, rather than the most progressive 60 percent who are now participating in the safety program and contest. The very fact that the portland cement industry can have a superior safety record is an indication that lime producers can achieve radical improvements in their safety programs.

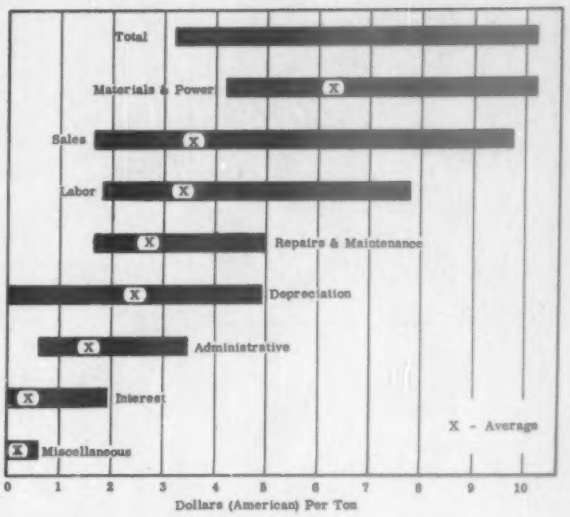
The same meeting saw the presentation of safety certificates to 19 lime producers who operated without a single disabling work injury during 1960. The leader in each category was presented with the ROCK PRODUCTS trophy. These were: United States Gypsum Co., Genoa, Ohio; National Gypsum Co., York, Pa.; Mississippi Lime Co., Peerless Rotary Plant, Ste. Genevieve, Mo.; and Marblehead Lime Div. of General Dynamics Corp., Thornton, Ill.

The paper on safety was just one feature of the two-day meeting that was one of the best balanced and well rounded meetings the Association has programmed in several years. Since the meeting was for production management and operating men, it was only to be expected that production problems should have priority.

Leading off the program was a detailed, well-documented report on production costs. Robert S. Boynton, the Association's general manager, discussed the production figures that he gathered on his recent trip to West Germany. While many of these dollars and cents figures show a wider range than many American producers, some of the most efficient plants in Europe obviously can produce lime at exceptionally low costs by any measure.

Fuel is one of the European lime producer's most costly ingredients, thus fuel efficiency is a prime objective. Even at that, the range of fuel expense is very wide, ranging from about $1.50 to $6.50 per ton of lime produced. Of those West German producers who answered their association's questionnaire only 10 admitted fuel efficiency above 70 percent.

Since this was the Association's first cost study there were a number of discrepancies which could only be explained by reporting errors. These can be reduced by better instructions and more reporting experience. However, lime producers in the United States might benefit from surveys among their own group. Cost studies would give each producer an opportunity to compare his costs with the average and the range reported for each major segment of production expense and to study what can be done to reduce costs.



West German lime manufacturing costs vary over a wide range, indicating a great discrepancy in reporting procedures as well as variations in operation techniques

Lime burning efficiency in gas-fired kilns was covered by Victor J. Azbe. Since natural gas is a clean fuel and may be piped as easily as water, it is easily wasted unless it is carefully controlled in the lime kiln. The Azbe approach to proper firing consists of high velocity projection through many ports with the volume increased by the addition of air and recirculating gas. Gas may be injected through side burners or center burners, at single, double or more levels. The operation of a natural gas fired kiln is improved with an automatic draw system and pressurized charging setup.

To date, the outstanding installation of a lime kiln using gas is at Holly Sugar Co., with its four active zones. Zone A, the calcining area, receives a homogenous mixture of gas and air which has been admitted to the kiln at the draw level. Zone B just above receives a substantial excess of fuel at five levels.

The third zone, C, would be circulating gas controlled, most of the gas from level B would be burned and some additional fuel is added. At the top, or D zone, some high pressure fuel may be

Please turn to page 114

SAFETY IS THE BADGE OF A PRO

by Enid W. Stearn

DON'T BE HARD HEADED, be hard hatted!" This is but one of the battle cries of the National Safety Council, which began an intensive hard hat campaign last July. Succeeding years will see similar efforts toward personal protection promoting safety shoes, safety glasses, and lockouts, the Council promises.

In 1959, 6 percent of all disabling work injuries involved the head. And of these it is estimated that at least 70 to 75 percent could have been prevented by the wearing of hard hats. Far from marking the wearer as an overly cautious "grandma", the Council emphasizes that a hard hat is the badge of a real "pro".

How do the rock products industries shape up when it comes to accident statistics in general? Table I shows the improvement taking place over a 10-year span.

But it doesn't pay to get complacent over these figures. Here are the average frequency rates of all industries reporting to the National Safety Council:

3.33—Cement
6.47—All industries reporting
9.74—Clay and mineral products
14.51—Quarrying
15.88—Mining, non-coal

Worse yet, all these industries are poorer than average when it comes to severity rates:

754—All industries reporting
937—Clay and mineral products
1,249—Cement
2,344—Quarrying
3,373—Mining, non-coal

Efficient production and safety always go hand in hand. This firm premise is the basis for the hard hat campaign, which was originally conceived as a one-year effort limited to the cement and quarrying industries. Now the campaign period is flexible, left to the judgment of each plant operator, and aimed at all the many areas which would benefit from hard hats.

Much of the workers' resistance to wearing such things as safety shoes and hard hats probably stems from the fact that they are unaware of recent developments that have made these articles more comfortable, less cumbersome, and in many cases less costly. For this reason, a good deal of the promotional material is aimed at the worker himself. A campaign guide is made available to supervisory personnel, as well as information on the Council's safety training aids.

The campaign starts off when a kit is mailed to the safety supervisor. It includes 2-in. stickers bearing the slogan "Hard Hats Save Lives," which are to be pasted on the hats themselves. Then there are 4 x 12-in. signs, with 4 different reminders: "Don't Be Hard Headed, Be Hard Hatted;" "Hard Hats Save Lives;" "It's Smart to Wear Your Hard Hat," and "Save Your Head—Wear Your Hard Hat."

The fourth aspect of the campaign is a series of four cartoon-illustrated flyers on head protection to be distributed to employes. The first, which covers history and development, mentions such interesting facts as the first use of "modern" hard hats, occurring in a California shipyard around 1918.

Then common objections to hard hats are discussed, and a rebuttal provided. Weight, perhaps the most often encountered gripe, is proven ill-founded because the average hard hat weighs only 14 oz., little more than any other hat in your closet. The Council also points out that many of its audience served either in World War II or Korea. Then they wore 52-oz. battle helmets, knowing that they could save their lives. Industrial hazards are perhaps less dramatic, but they can be equally fatal. And tests prove hard hats

Table I

Industry	Units	Frequency 1949	Severity	Units	Frequency 1959	Severity
Cement	139	5.18	2,210	175	3.33	1,249
Clay products	120	22.33	2,330	266	9.74	937
Surface mining	76	12.88	2,330	119	8.52	1,680
Mining, underground non-metal	44	24.92	3,490	51	19.35	3,157
Quarrying	261	17.36	4,040	488	14.51	2,344

Frequency—number of disabling injuries per million man-hours of work
Severity—total charges in days per million man-hours of work

are actually cooler than conventional headgear, as the shiny surface reflects heat and there is air space left for circulation. They also provide some shielding properties against noise, the suspension is adjustable, and a chin strap can be added if necessary.

The third flyer presents dramatic but typical cases of lives saved—from flying and falling objects, swinging hooks, etc. The fourth and last takes up care and maintenance, the importance of keeping the hat clean, inspecting it often for weakening defects, and turning it in on a new one before trouble arises.

The Council is forever adding to its list of safety training programs and materials. Its Safety Training Institute generally offers four different courses.

(1) Fundamentals of Industrial Safety is in such demand that five sessions per year are held. They include: accident records and analysis (including management reports); personal safety factors; inspection procedures; mechanical safeguarding; industrial health hazards and controls; creating interest in safety; personal protective equipment.

(2) Safety Management Techniques—in two sessions.

(3) Industrial Hygiene for Safety Engineers covers respiratory protective equipment, exhaust ventilation, noise control, dusts, etc.

(4) Radiation Safety.

A correspondance program more practical for rock products men is the Home Safety Course for Foremen and Safety Supervisors. In little over a year, and at a cost of only $30 each, approximately 900 foremen have studied on their own time for the exams based on the 359-page Supervisor's Safety Manual. Graduates of this course have praised it highly, and it is interesting to note

Please turn to page 114

Cooperation breeds success . . .

. . . a principle to which the National Slag Assn. resubscribed at its annual meeting in October

Edward C. Levy, Sr., President
National Slag Association, 1961-1962

FULL AND WILLFUL EXCHANGE of information on operations and technical developments, and a program of cooperative research are good industry practices and those that pave the road to success. The National Slag Association subscribes to that principle and, at its 44th annual meeting in Pocono, Pa., October 3-5, 1961, the group took further action to improve its product and its acceptance in the market place.

Mr. Edward C. Levy, Sr., president of NSA, summed it up this way: "We've gained recognition for our product because information concerning technical developments has been shared willingly. Our research programs have brought good results—all because we've worked together."

The Association's Research & Product Development Committee did not have a specific future program to itemize for the slag processors at the time of the meeting. But it expects to have a detailed one before the end of the year. The directors, expressing their confidence in the committee and its work, agreed to approve the program when it is established and submitted to the executive committee with recommended action.

Mr. Stewart H. Steffey, chairman of the R&PD committee, announced that all of the great volume of work done previously in product development and research on slag is being recorded in one volume. It will be valuable to processors when available, since such collection of information has not been made before.

Exchange of ideas and experience was a new procedure adopted at the meeting in January of this year of the Technical Committee, chairmanned by Howard T. Williams. Each member of the committee in attendance discussed the individual problem with which he was familiar, such discussion taking up about half of the meeting

time. Revisions in rules for operation of the committee were to be discussed at a Cleveland, Ohio, meeting early in November.

Advertising and promotion will continue to be an important phase of NSA's work. Last year the Association authorized $7,500 to make a movie in conjunction with the Iron & Steel Institute, but that project has been dropped. However, Walter B. Evans, chairman of the Advertising & Promotion Committee, reported that his group feels strongly the need for a blast-furnace slag movie to show to architects, and proposed to make further investigations into the possibility and cost of one. He also suggested that magazine and catalog ads carried the past year be continued.

Improving quality and maintaining uniformity in slag lightweight aggregate is an important goal for NSA. Serious consideration has been given to an investigation on pelletizing or some other improved form of expanding blast furnace slag into lightweight aggregate. But even in its present status, noted E. W. Bauman in his annual report, "expanded slag possesses excellent qualities and contributes these properties to resultant concrete or concrete products." He referred to two ACI Journal articles, published this year, that were highly complimentary to expanded slag. One, published in the July issue, showed that tensile strengths of expanded slag concrete held up "remarkably well." The other, in the August issue, indicated that results of shrinkage tests on expanded slag are low.

The practical rather than the laboratory approach is preferred by Mr. Bauman in approaching the problem for improving expanded slag. He suggested that a member company "undertake the actual experiments with molten slag as it comes from the furnace, the work being done on a practical workaday basis at a plant." NSA should be allowed to participate in special costs that would be involved, he suggested.

Laboratory and engineering work on slag and slag products continues to provide information of value to processors and to current and potential users. NSA Chief Engineer D. W. Lewis highlighted these research projects:

1. Corrosion of roofing metals used with slag and gravel. Started in 1955, completed during the past year. Test results were completed and circulated.

2. Chemical, petrographic and physical properties of slag. Co-operative project at Penn State University. Tests on samples after three months of weathering show that aging decreases Los Angeles Abrasion loss and that unit weight of the coarse aggregate increases slightly.

3. Freezing and thawing tests. Laboratory study being set up to determine relative effects of test methods on slag concrete, including freezing and thawing in water, freezing in air and thawing in water.

4. High-strength slag concrete. Study, supplemental to former one, being set up in laboratory to learn effects of varied cement contents with constant rate of admixture use, effects of varied cement contents with constant rate of cement content, and relative effects of admixture with slag, stone and gravel aggregates.

5. Iron in slag aggregate. Samples from 14 sources tested. Analyses not complete, but show wide variations in iron content. Further tests warranted, possibly to determine what constitutes realistic limits of iron content, and to develop improved test methods.

6. Autoclave corrosion. Second series of tests nearly complete. Purpose—to verify importance of oxygen in controlling corrosion and to get more data on corrosion control by "purging" or oxygen removal from the autoclave.

The NSA engineering department has been active in working with national technical societies, Federal and other agencies on tests, specifications and other factors concerning use of slag. An interesting test was one on staining of slag block when painted. One possible determination was that paint ingredients themselves are a factor in a staining reaction.

Officers of NSA serving in 1961 were re-elected for the following year. They are: Edward C. Levy, Sr., president; George W. Lanier, vice president; E. W. Bauman, managing director-secretary, and W. S. Shaw, treasurer. Fred Hubbard, formerly research director of NSA, was elected to honorary directorship along with C. A. Barinowski, retired. The 45th annual meeting of the Association will be held in Washington, D.C., but no date was confirmed.

A joint luncheon with the ladies and an annual banquet were characteristic highlights of the meeting. In addition, the last day of the meeting was reserved for a special inspection tour of the new research laboratory of Bethlehem Steel Co. at Bethlehem, Pa. Mr. and Mrs. H. T. McIlwain were hosts at a luncheon at Soucon Valley Country Club prior to the inspection tour. END

Clay floors and low ceilings present no obstacles to this front-end loader

Special machinery pays off for underground limestone producer

EVER SINCE 1912, the strictest attention to efficiency has been paying off for Thompson-Strauss Quarries, Inc., Kansas City, Kan. Back in those days, 50 tpd. of limestone traveled to the crusher on mule-powered mining cars, where it was prepared for use as ballast by area railroads. This end use lasted until about 1946, when the company moved into the graded aggregate field.

Custom-built equipment is one of the answers to its million tpy. success. Only the loading and haul road maintenance vehicles are standard—and even they have innovations which the company has discovered to better fit its needs.

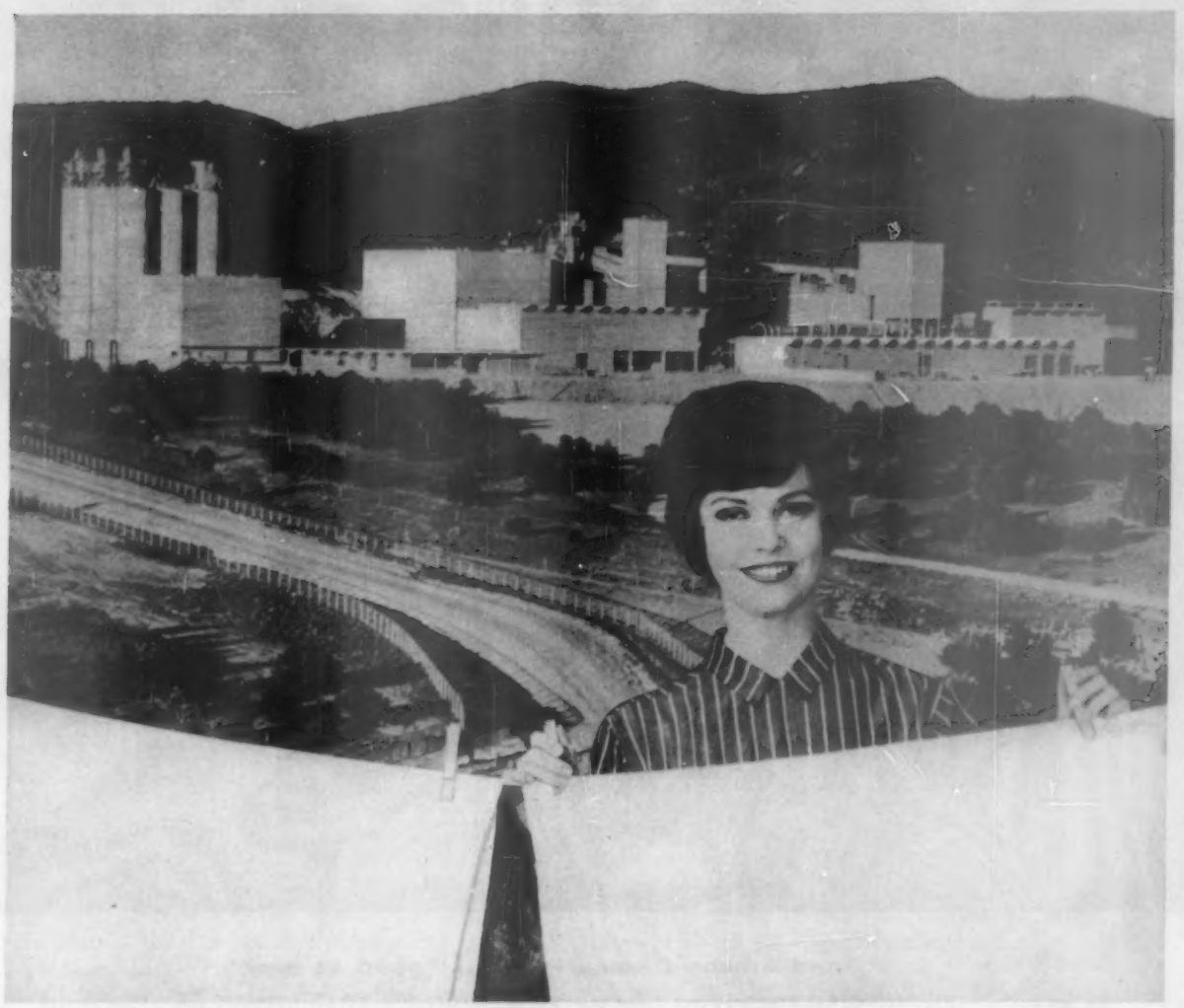
Loading and hauling for each day's operation begins at midnight, with three of the six tractor trucks and 16-ton end-dump trailers feeding the 30-in. gyratory primary crusher. The trailers used were built to Thompson-Strauss specifications with 7-ft. sides to assure ease and safety of loading in the 14-ft. heading of the quarry.

A firm believer in preventive maintenance, Charles L. Scott, company vice president and quarry general manager, has a full complement of haulage trucks on standby basis during each of the two daily shifts. This allows eight hours each day for necessary repair and maintenance on each shift's equipment and assures that unexpected breakdowns will not interfere with the steady flow of shot rock to the crusher.

All on-highway hauling of aggregate is done by contract truckers on a ton-mile basis. The only truck, other than the shot rock haulage units, owned by Thompson-Strauss is a 12-ton rig used for stockpiling. It is an end-dump unit with full power steering, automatic transmission, air brakes, and a hydraulic system operated off the transmission so that dumping can be started while the truck is in motion. An added feature, which caused some head-scratching during its manufacture, is the specification that it be able to negotiate a 15 percent grade in forward or reverse.

Thirty-two hundred hours of underground operation over a year's period with a manufacturer's test machine helped Thompson-Strauss find the wheel loader most suitable for its operation. Six years ago a switch had been made to wheel loaders from shovels and track-type loaders, with one of the originally purchased wheel loaders still being used for stockpiling. But in August 1959 loading was started with a test model. This test machine

Please turn to page 107



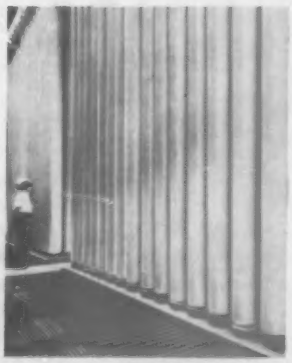
The Ideal Cement Co. plant at Tijeras, N.M., poses no problem for housewives living nearby.

Q. What keeps the air "white sheet" clean at Tijeras, N. M.?

A. Fiberglas fabric filters... they operate efficiently at temperatures above 500°F.—twice the limit of other fabrics.

Fiberglas* fabric filters have been in continuous use in cement plants for three or more years. They assure virtually 100% kiln dust filtration, with no condensation or corrosion. The smooth, silicone-treated surface cleans with ease. Ideal Cement Company installed them in its new stackless Tijeras plant, named as one of 1960's best by Factory Magazine. Their thermal endurance, dimensional stability, and resistance to moisture and chemicals recommend them for many other problem situations, too.

CLEANING AIR IS OUR BUSINESS. Write for our free authoritative guide book: "Fiberglas Fabric Filters for High Temperature Dust and Fume Control," based on our presentation at the 1961 APCA Annual Meeting. Owens-Corning Fiberglas Corporation, Industrial Textile Division, 717 Fifth Avenue, New York 22, N. Y.



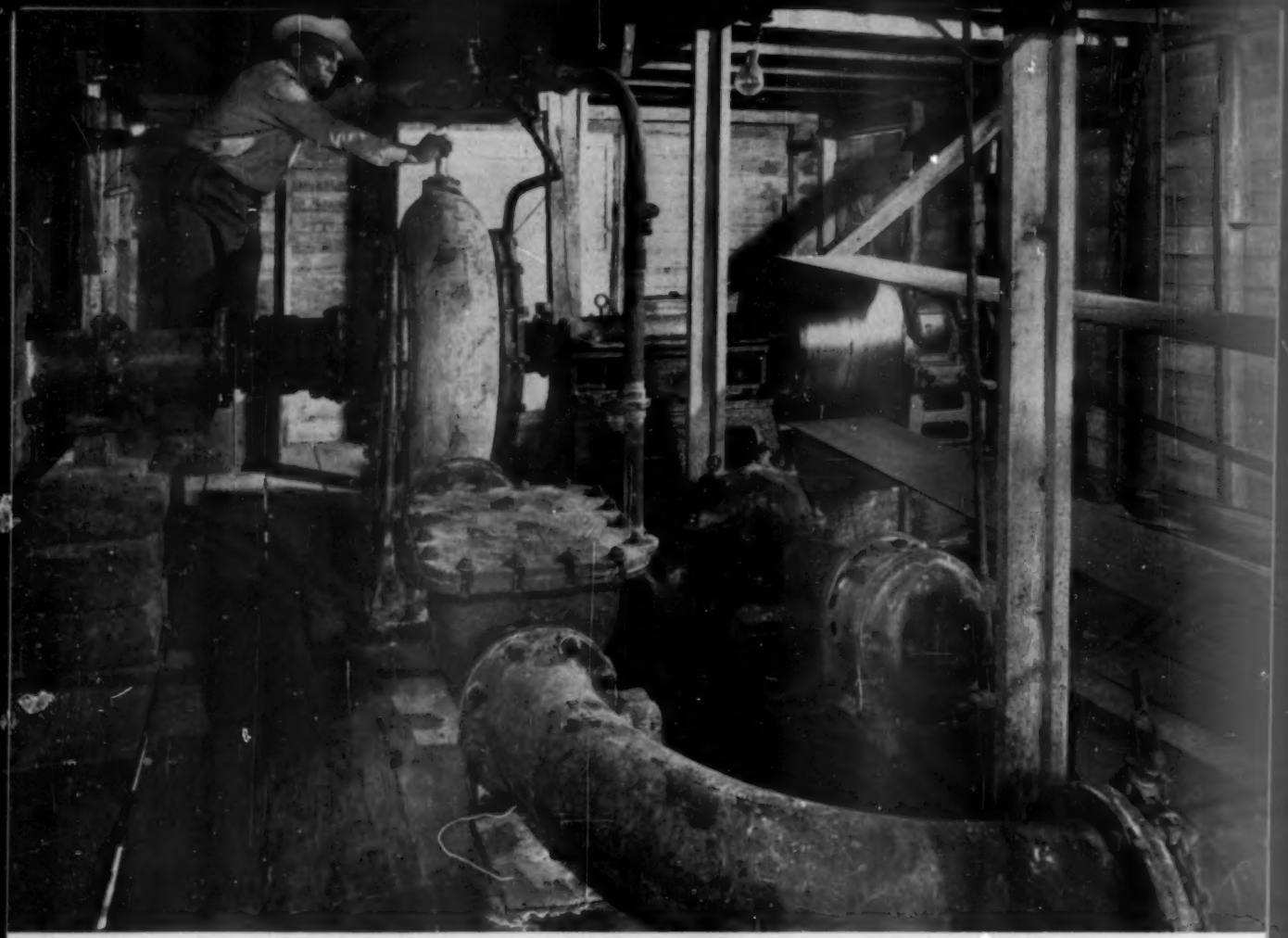
Over 5 acres of Fiberglas fabric filters are in use at the Ideal Cement plant.

Makes the glass yarns, not the fabrics

OWENS-CORNING FIBERGLAS

*T-M. (Reg. U.S. Pat. Off.) O-C.F. Corp.

Enter 1222 on Reader Card



30 YEARS OF SERVICE

and Amsco Dredge Pump is "good as new"

Sand and gravel from the Arkansas River are hard and abrasive. That's why Johnson Sand and Gravel, Larned, Kansas, bought Amsco pumping equipment in 1931.

This *same equipment is still on the job* and owner Willis Eakin says, "After 30 years of dependable, trouble-free service it is still good as new."

Mr. Eakin owns an Amsco Type M 8″ pump with Amsco 90° and 45° elbows and an Amsco Flap Valve. This equipment handles 56,000 to 80,000 tons yearly and during peak seasons often operates 30-40 twenty-four hour days at a time. Material measures as much as 2″ to 3″ in diameter.

Amsco Dredge Pumps aren't "sold off the shelf." Each one is custom engineered to the specific requirements of specific jobs. For example, Amsco "HC-250" Alloy, a special high chromium iron, is used for highly abrasive applications. Amsco Manganese Steel, "The toughest steel known," has no equal where impact is encountered.

Your nearby Amsco Representative can make a free appraisal of your dredging job and recommend Amsco Dredge Pumps, swing sheaves, flap valves, elbows, hose nipples and hand hole nipples for the toughest jobs known. We'll be happy to send you his name or send him around to see you.

1361

AMSCO

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILLINOIS

AMERICAN Brake Shoe COMPANY

Other plants in:
Denver • Los Angeles • New Castle, Delaware
Oakland, California • St. Louis
IN CANADA: Joliette Steel and Manitoba Steel Foundry Divisions
IN MEXICO: Amsco Mexicana, S.A.

Special machinery pays off . . .

continued from page 104

made possible a loading increase of three tons per shift.

Important, too, were the safety factors involved. The new wheel loader enables the operator to get on and off without danger of being crushed by the lift arms. No part of the lifting mechanism extends above the bucket in the raised position, doing away with the danger of breaking off stone overhead in the quarry roof, and allowing working in a lower heading. Fenders prevent material from being thrown onto the operator by the tires.

An alternator was added to the generator on the new wheel loader, as well as on all trucks used underground. This allows use of more light in the loading area. The compact diesel engine has such excellent fume characteristics that no ventilation problem is created.

Thompson-Strauss uses the room and pillar method of quarrying, with rooms measuring 45 x 45 ft. and pillars 22 x 22 ft. Because of the difference in temperature between the constant 55-deg. air inside the quarry and that on the outside during the summer months, moisture-laden air is constantly entering the mine and this causes the rock floor to soften, thus making it more liable to break up. Since tires are the biggest maintenance problem, according to Mr. Scott, the haul roads are bladed throughout the summer on a twice-weekly schedule. This makes for better cycle time, less spillage and better footing for the trucks. During the winter months, the haul roads must be sprayed to hold down dust, with grading done on a less-frequent schedule.

Additional innovations which have helped keep costs down through the years include conversion of all trucks from gasoline to diesel engines several years ago. A comparison of fuel costs during the intervening period shows that trucks now burn an average of 7½ gal. of diesel fuel each per shift, compared to the 40 gal. of gasoline formerly used.

Unwilling to merely abandon the worked-out sections of the quarry, the company in 1952 formed Inland Cold Storage Co., Inc., which today operates a public warehouse with 8,500,000 cu. ft. of zero deg. cold storage facilities and 560,000 cu. ft. of cooler storage maintained at 34 deg. In addition, manufacturing and processing facilities for the various frozen food manufacturers who use the facility are provided.

At the present rate of production, limestone reserves on the Thompson-Strauss property are expected to last for another 30 years. With another 5,000,000 sq. ft. of space as yet undeveloped, Thompson-Strauss is laying plans for possible light industry development and ultra-high security vault storage installations as further uses of the abandoned mine space. Since approximately 185 ft. of stone cap covers the 14-ft. high heading, possible uses could include storage of irreplacable archives in the event of atomic attack. END

MAJOR EQUIPMENT REFERENCE

Tractor trucks, (6)	Dart Truck Co.
End-dump truck, 12-ton	Dart Truck Co.
End-dump trailers, 16-ton, (6)	Landis Steel Co., Inc.
Wheel loader, 2¾-cu. yd.	Caterpillar Tractor Co.

Aggregates are stockpiled aboveground ready for the Kansas City construction market

Crushed stone comes into its own as a source of coarse aggregates and crushed sands

Aggregates production at dams, Part 5

Southern dams call for innovations

by W. B. Lenhart

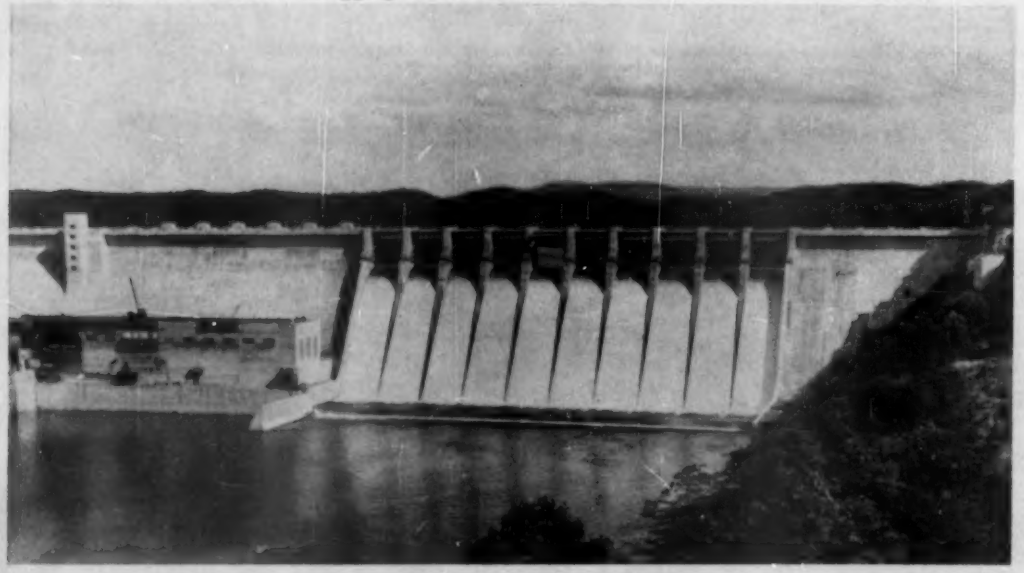
AGGREGATES PRODUCTION for dams in the areas east of the Mississippi River is different and quite a bit simpler from the pattern in the areas west of the river. In the east, crushed stone plays the lead as a source of coarse aggregate. In many instances, particularly in the late 1940's and early 1950's, sand was manufactured from coarser materials. Crushed limestone played an important part and in several instances limestone sand was manufactured using dry processing. Rod mills operating wet seemed to be the favorite fine grinding unit for the granites and harder types of rocks. The operations leaned towards rolls, hammermills and ring roll crushers for sand manufacture.

In the east, possibly 75 percent of the total aggregates used by the dam builders was purchased direct from commercial producers. This eastern procedure stems from the fact that where dams were built there was a quarry nearby with crushing and screening equipment already established and the operation continued long after the construction work was finished.

Natural sand and gravel was not used in many cases simply because none was easily and cheaply available. The remaining 25 percent of production came from plants built by the contractor, or by a commercial producer at or near the job. Here again crushed stone was widely used. It is note-

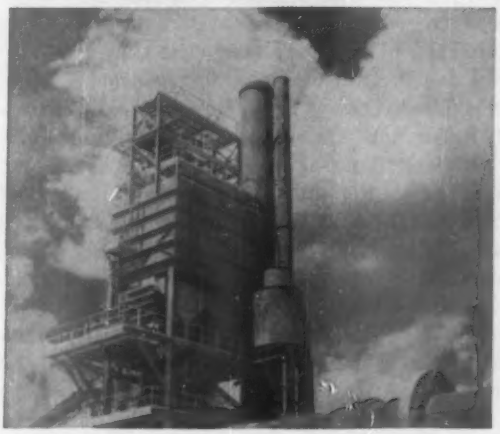
Please turn to page 110

Limestone was the source of all aggregates for the Wolf Creek Dam on the Cumberland River



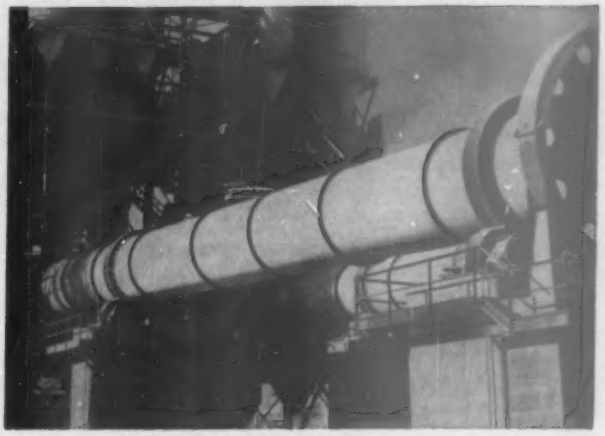
KENNEDY lime plant equipment

KENNEDY Stone Preheater



Puts kiln exit gases to work to partially calcine feed. The KENNEDY Stone Preheater makes the rotary kiln the most economical producer of high quality lime.

KENNEDY Short Rotary Kiln

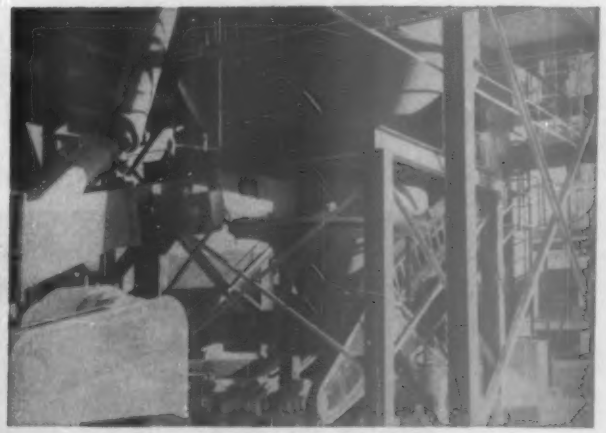


KENNEDY heat-saving auxiliaries make long kilns unnecessary. There is less kiln to buy and maintain; there is less brick — fewer foundations; alignment is simpler.

KENNEDY Centralized Kiln Control

A single, attractive cubicle houses all instruments essential to system control. Each is factory-assembled and checked to simplify installation and insure efficient overall operation.

KENNEDY Contact Cooler



Further economies are achieved by the highly efficient transfer of heat from the discharged lime to the combustion air, while rapidly lowering lime temperature. Unit requires little headroom.

We invite your request for further particulars.

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

Enter 1228 on Reader Card

Aggregates production at dams . . .

continued from page 108

worthy that in practically every instance where a contractor, or group of contractors, built a plant to supply the aggregates the contractor or one of the group was already a commercial aggregate producer somewhere. In some cases rock was quarried and given a preliminary crush by a commercial producer. The crushed rock was then hauled to the damsite where a plant had been erected to crush and screen the material for them.

In the deep south, limestone vied with granite as the aggregate source. Sand and gravel were in the picture, but to a lesser degree. Granite operations here shipped large tonnages of riprap and jetty stone to dams. In at least one instance a special operation was set up by a commercial producer to supply large stone for the Santee-Cooper Dam in South Carolina.

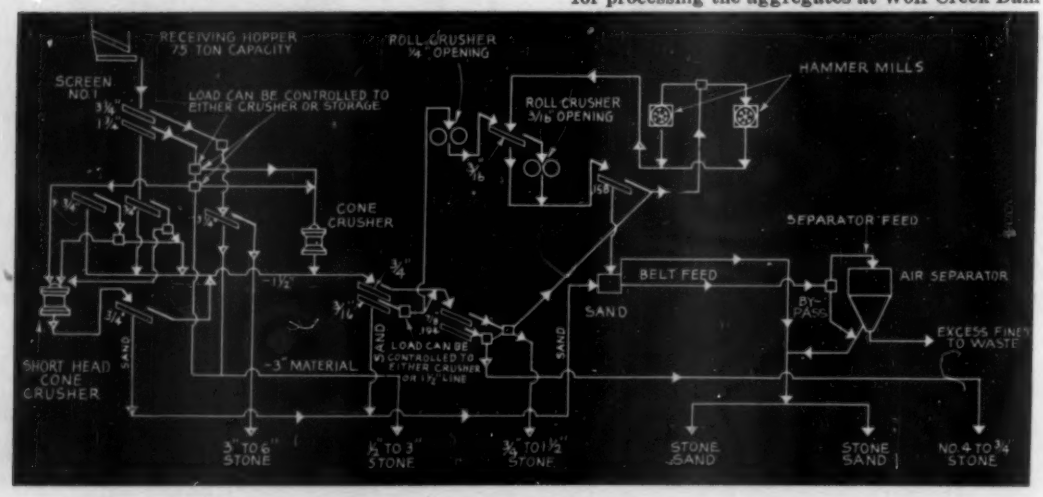
In the central states, and at one dam in the deep south during the late 1940's, crushed limestone was the aggregate used—with sand manufactured by dry processing. The dams, four in all, were built in Georgia, Kentucky, Texas and Oklahoma and all were operated by commercial producers. The builders or sponsors of the dams were quite emphatic in their enthusiastic endorsements of limestone aggregates. Great durability was stressed and 150 years mentioned as the minimum life span of the structure.

Wolf Creek Dam was built on the Cumberland River in Kentucky; Ft. Gibson Dam on the Grand River in Oklahoma; Whitney Dam on the Brazos River in Texas and Allatoona Dam built on the Etowah River in Georgia. All were built by the U. S. Army Corps of Engineers. All were supplied aggregates by commercial producers. For Wolf Creek Dam, the Cumberland Quarries Inc. were the producers. For Ft. Gibson Dam it was M. O. Weaver, Inc., at Whitney Dam, the Concrete Materials Construction Co., and for Allatoona Dam, Lambert Bros. (now a division of Vulcan Materials). All produced four sizes of coarse aggregate and one sand manufactured from the limestone. All used dry screening techniques. Cumberland Quarries Inc. did install scrubbers and sand drags but they were not used. Considerable screen area was used with inter-plant flexibility stressed, especially in the sand manufacturing section. In addition to primary and secondary crushing, hammermills, ring rolls and standard rolls were used at these jobs. Air separation was practiced for the fines. At Ft. Gibson Dam coarse aggregates were washed and at Allatoona a small rotary dryer preceded the fine grinding equipment.

The above four jobs were all quite similar in the general pattern but differed in details. Each was described in ROCK PRODUCTS, and anyone contemplating manufacturing a dry sand might study these detailed reports to their advantage for they include a great deal about requirements:

Wolf Creek Dam, August 1947, p. 106
Wolf Creek Dam, December 1948, p. 102
Ft. Gibson Dam, December 1948, p. 98

This is the flow of materials set up by Cumberland Quarries, Inc., for processing the aggregates at Wolf Creek Dam



Whitney Dam, December 1948, p. 101
Allatoona Dam, May 1948, p. 136

At Wolf Creek Dam in Kentucky, the aggregates producer gave the rock a primary crushing and screening at a plant near the quarry. The minus 1½-in. rock was then re-screened through a screen with a ¾-in., ⅝-in., or ½-in. opening and the throughs discarded. The size of the mesh used depended on whether the stone was wet or dry. This screening technique got rid of practically all undesirable fine material occurring between the layers of bedded limestone and contributed much to the success of the operation. The accepted oversize rock from the screening operation was trucked to the damsite where a second aggregate processing plant finished the job.

The stone was a high calcium limestone, with production at 500 tph. to make the 1¼ million cu. yd. of concrete involved. The sizes of stone produced and the specifications for the sand were as follows: 6 x 3-in., 3 x 1¾-in., 1¾ x ¾-in. and ¾-in. x No. 4.

Sand gradation (percent passing)

4 to 15	100 mesh
15 to 30	50 mesh
45 to 80	16 mesh
98 to 100	4 mesh
100	⅜-in. mesh

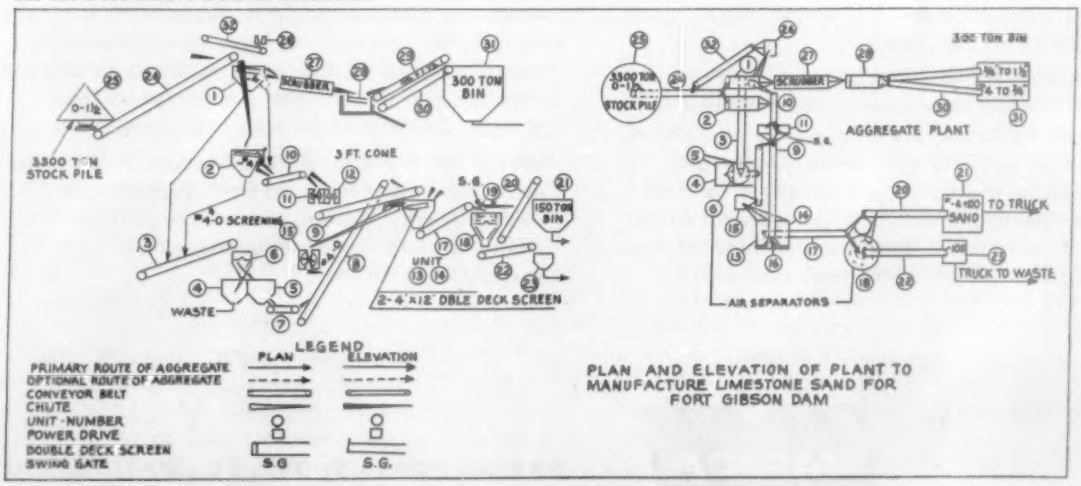
At the plant about 12 percent of the sand was minus 100 mesh. The concrete contained 25 to 27 percent sand. Slate and elongated particles in the sand fraction were objectionable. Rolls and hammermills successfully coped with the problem, because the sand had to consist of at least 80 percent cubical or rounded particles.

Ft. Gibson Dam on the Grand River in Oklahoma was another job using high calcium limestone as the source of coarse aggregate and a manufactured sand. The sand was processed dry, using screens and air separators for the dust and finer sizes. Hammermills and a ring roll mill ground the sand for stone ranging in size from 4 in. down to ½ in. M. O. Weaver Inc. was the commercial producer building and operating the plant. The article about this job was prepared in considerable detail by George C. Hawkins, designing engineer for the Ft. Gibson plant.

At Whitney Dam on the Brazos River in Texas, Concrete Materials and Construction Co. were the commercial producers who built and operated the plant. Limestone was the aggregate source, and sand was manufactured dry from the stone. Hammermills and ring roll crushers were used. Two sizes of sand were prepared from screens and a third from air separators, and these were later blended to meet specifications. The air separators worked very satisfactorily on dry material, but on damp material the capacity was reduced.

Allatoona Dam built on the Etowah River in Georgia was the fourth dam completed in the early 1950's using limestone for both the coarse and fine aggregates. *Please turn to page 113*

Here's how M. O. Weaver, Inc., produced limestone sands and coarse aggregates for the Fort Gibson Dam in Oklahoma



PLAN AND ELEVATION OF PLANT TO MANUFACTURE LIMESTONE SAND FOR FORT GIBSON DAM

Leaders in limestone loading

These 93-M shovel twins are half of a Marion foursome that help keep hundreds of tons of limestone rolling out of this Illinois quarry every day.

Despite their size—both pictured machines carry 2-1/2 yard dippers—these massive diesel units have the built-in agility and short cycle time of smaller machines. Uncomplicated, muscle-multiplying Marionair control gives the operators wrist action control of all machine functions... lets them crowd, swing and dump in one smooth, fast operation.

Here are units that are big and strong in the right places to keep downtime at an absolute minimum... machines with a design simplicity that makes high maintenance costs a thing of the past... profit-oriented machines that will still be carrying their share of the load years from now.

Write for bulletin 397-H today. Better yet, let a Marion mining expert explain the reasons why the 93-M will probably make dollars—and sense—in your quarry operation.

You get MORE WITH MARION

MARION POWER SHOVEL CO., MARION, OHIO

A Division of Universal Marion Corporation

Aggregates production at dams . . .

continued from page 111

The dam, while not a large one, involved some half-million tons of sand and stone. The dam is 170 ft. high and impounds 253,000 acre-feet of water.

The material for it was produced by Lambert Bros. and the Hershaw Mining Co., commercial producers who opened up a quarry and built a new plant about 12 miles from the damsite. Trucks then delivered the finished stone to the job. Sand was manufactured dry from ¾-in. limestone previously dried in a small rotary furnace by hammermills and rolls. Minus 200-mesh dust from the system was collected in wet collectors and wasted.

Riprap and jetty stone production for the Santee-Cooper Dam in South Carolina was another instance where commercial producers got some benefits. They were processed with 2-ft. cubes of granite being about the top size. Stone from 6 in. up to 300 lb. was used just below the larger stone with large stone placed near the crest of the dirtfill dam. Six × ¾-in. stone was used near the toe of the dam. Lambert Bros. operated the granite quarry near Cayce, S.C., leasing a part of the quarry of Weston & Brooker Co.

The November 1948 issue of ROCK PRODUCTS described the blasting and drilling procedures in some detail. Shovels loaded the larger rock direct to trucks. Rock from 6 in. up to 300 lb. was oversize from a vibrating grizzly. A pan conveyor fed the grizzly and a second pan carried the sized rock direct to trucks. Trucks hauled the riprap to the Congaree River where a stiff-leg derrick loaded the stone to barges.

Only on a few dams in the Rocky Mountain area, or in the Sierra Nevada mountains and in the northwest where rugged terrain prevails were similar quarry operations practiced. At the larger dams in the west, where concrete yardage was in the million or more cubic yard brackets, sand and gravel plants were established at or near the damsite by commercial producer contractors. In one instance, two new plants supplied the same job at the same time. One plant was built and operated by a commercial producer and the other plant by the contractor.

Portable plants played a major role on the smaller dams, particularly the dirtfill dams where the concrete yardage might represent 2 to 5 percent of the total yardage involved. Some were owned by commercial producers who maintained a policy of having a floating plant out in the sticks while still anchored to their home base. Others were owned by commercial contractors. Examples of the latter were the Kaiser interests, Morrison-Knudson and others.

Where dirtfill dams were built near larger cities or towns it was not unusual for the ready-mixed concrete plant to play an important part, but aggregates sand and gravel were purchased from nearby commercial sources.

Sand and gravel in the west is an exceptionally good material in about 99.9 percent of the cases, as viewed by present standards. It is a clean, hard, durable material and needs only conventional washing and screening. Two exceptions might be mentioned. One source contained an excessive amount of soft and lightweight material—siltstone, tuffa, hardened clayballs, etc. Heavy Medium Separation successfully upgraded both the sand and the gravel. The dam is 300 ft. thick at the base and over 700 ft. high. The good aggregates are used for 10 ft. of thickness of the upstream face of the dam and for 10 ft. of thickness of the downstream face. The in-between concrete is made using sub-standard aggregates. This means that at the base where pressures and strains are the greatest there will be 20 ft. of acceptably (by modern standards) good concrete and 280 ft. of questionable material. Contractors are supplying their own aggregates here. We are inclined to think that if commercial producers were doing the job, their skill and experience would up-grade all of the sand and gravel used.

The second case involved two Federally-employed engineers who asked the head of the materials division of a certain state highway department regarding the aggregates in a certain valley. They were told, ". . . it's the worst in the state if not the worst in the United States . . .". The sand among other defects had the property of "progressive disintegration". That is, on standing the particles fell apart. The coarse aggregate was shot full of agates, cherts, etc. However, the sponsors went ahead anyway and built the dam using the "worst" after it had been processed in a conventional washing and screening plant.

We watched the concrete pour at this dam for several days and the concrete we saw was rough—practically a no-slump concrete. Vibrators, however, soon compacted the concrete to conventional material. We have superficially examined this dam twice since it was built and found no reason to adversely criticise the concrete. Maybe the "worst" can be useful if one knows all the answers. END

Safety is the badge of a pro . . .

continued from page 101

that the Portland Cement Association has been instrumental in encouraging producers to have their men sign up.

Other manuals, monthly newsletters, data sheets, special industries material and safety-graphs (illustrated flipcharts for effective talks to personnel), are other items you can obtain from the National Safety Council's prolific assortment. An up-to-date film directory is now available, cataloging all its films and filmstrips.

Noticed any "turtles" or "owls" around your plant? Very possibly you or some of your employes could qualify for membership in some of the clubs whose elite members are all men who have been saved from death or severe injury by personal protective devices.

(1) The Turtle Club, which has gained some 2,600 members since its founding in 1949, is composed of men who have been saved by their hard hats. Sponsored by a hard hat manufacturer, members receive an award, usually at a dinner ceremony—and of course a new hard hat.

(2) The Wise Owl Club, sponsored by the National Association for the Prevention of Blindness, does approximately the same thing with regard to safety glasses.

(3) The Golden Shoe Club performs the same function for safety shoes, and is sponsored by a manufacturer.

(4) The Canadian equivalent of all these combined, with the inclusion of buoyancy equipment, is the Beaver Club.

In reporting accident statistics, the National Safety Council must rely on information voluntarily sent in. It has no way of forcibly extracting complete figures for any segment of any industry. Probably the rock products operators with the poorest safety records are the most careless or delinquent in reporting their case histories, meaning that the statistics given above would reveal a worse situation if they were complete.

So, since the statistics certainly warrant it, and the National Safety Council is doing all it can to assist you, why not step up your accident prevention efforts with your own hard hat campaign? END

National Lime Assn. meeting . . .

continued from page 99

added or compressed air to achieve near-perfect mixing of air and fuel. Of course, all fuel ports have recirculating gases added to the incoming natural gas. The sugar producer was particularly interested to have as much carbon dioxide gas generated as possible. This was drawn off at the top of the kiln and piped to the sugar-making process.

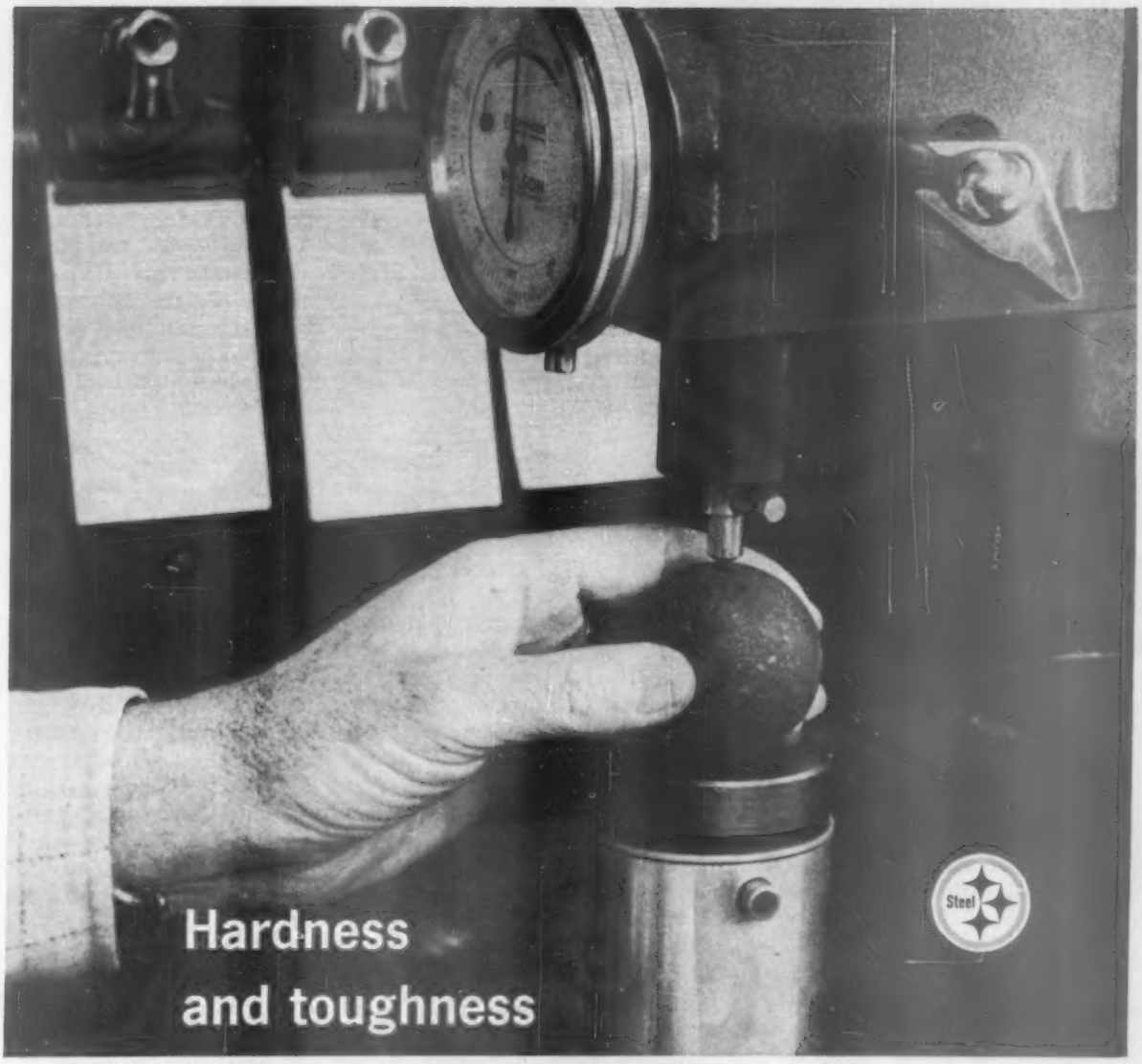
Mr. Azbe is the sponsor of the Azbe Lime Award, a $1,000 grant given annually for the best technical paper on lime. This year's medalist is Dr. Rune Hedin of the Swedish Cement & Concrete Research Institute. His prize-winning paper is "Investigation of the Lime Burning Processes," an explanation of the causes for the variations in the physical structure of calcium oxide.

Other causes for changes in the chemical and physical performance of lime were outlined by Canadian consulting engineer M. F. Goudge. The role of trace elements in lime making is too little known, yet what is known points to the extraordinary effects of trace elements far out of proportion to their concentration. Some of these elements are measured in parts per million by weight, yet they have been known to suppress desirable reactions and accelerate unwanted effects in lime making.

Some 50 trace elements are present in lime and 33 of these are relatively common. Some of these are useful, even essential, for limestone or lime used in agriculture, including boron, zinc, copper, cobalt and manganese. But some elements are a detriment to processes using lime. Cobalt is one of these, for it makes glass undesirably blue. Even the microscopic amounts worn from hardfacing in limestone crushers can color glass. Phosphorous, selenium, fluorine and arsenic can produce poisonous compounds in lime making or lime processing. Perhaps when a lime producer has firing or slaking problems which baffle him, trace elements may be the cause.

Perhaps the most practical ideas for the lime producers at the meetings were offered by Edward Tanski of Mercer Lime Co. Over a period of years he has been experimenting with refractories in an effort to determine the most efficient one. At this time, the solution seems to be a combination of

Please turn to page 116



have earned customer acceptance

Hard. Tough. Consistently uniform, right down to the core. Those are the qualities that have sold more than a million tons of Sheffield Grinding Balls. They've proved their dependability on every kind of grinding job, all over the world. Moly-Cop Balls keep their sphericity longer, give a better grind at a lower cost per ton. That's because Sheffield alloying, heat-treating and forging are kept consistently uniform, too . . . by constant quality control. **Sheffield Plants: Houston • Kansas City • Tulsa**

SHEFFIELD
MOLY-COP
Grinding Balls

ARMCO Sheffield Division

Enter 1245 on Reader Card

National Lime Assn. meeting . . .

continued from page 114

chrome-magnesia brick laid up in alternating rows with an alumina-silica brick. This arrangement apparently gives an ideal combination of the heat resistance of magnesia brick with the good high heat structural strength of the alumina brick. A new kiln has been lined in this way and it will be examined at the end of a two-year campaign to see if it is as successful as the experimental sections in Mercer's other kilns. Mr. Tanski's experiment seems to bear out the experience of others at the meeting: High magnesia refractories are becoming more widely used in the lime industry than ever—in spite of their relatively high cost and a tendency to spall.

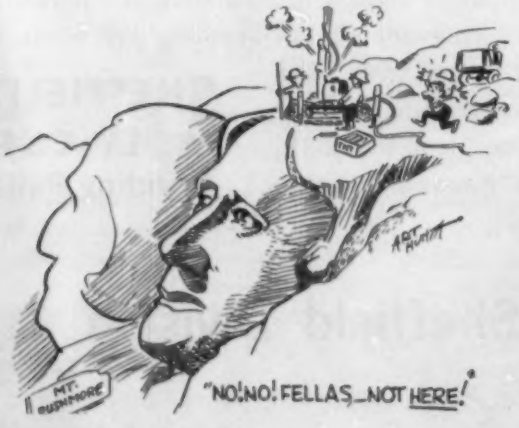
The 90 operators present at the Washington meeting were treated to an afternoon program at the National Bureau of Standards. There they were introduced to many of the modern instruments and techniques that are so essential these days to making and testing lime. At the Bureau a paper was presented covering "Modern Statistical Quality Control Concepts for Materials Testing." END

Safety—from A to Z . . .

continued from page 95

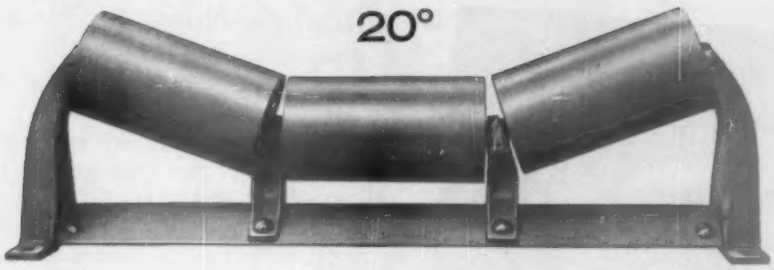
Either tie a man in place or build a fence around him! The high frequency of injurious falls during rail and truck loading operations prompted this warning by James M. Christie, safety engineer, Portland Cement Association. He demonstrated ample reason for the PCA insistence that a safety belt and line, properly attached, adjusted and anchored, shall be worn by each person working on an unprotected perch over 5 ft. from the ground.

Several of the other sessions also contained much of interest to the rock products industry. At one, the role of the safety engineer was presented and debated by men on the academic side of the fence. Thomas N. Rockwell, professor of industrial engineering, Ohio State University, set up these "design specs": (a) detailed knowledge of plant operation; (b) ability to investigate and reconstruct events; (c) work simplification know-how; (d) background in method study and creative engineering—safety or hazards are sometimes an integral part of a specific job; (e) background in "human engineering," the behavioral sciences, the creation of a psychologically safe working climate. George W. Harper, professor of mechanical engineering, University of Illinois, declared that safety is not the doctrine of risk avoidance; rather it is the limitation of dangers by controlled risk taking. The safety engineer, according to him, should fill the role of a staff consultant in charge of setting up departmental rules and systems of induction training of employes. Responsibility for actual enforcement should preferably rest with the line supervisors.

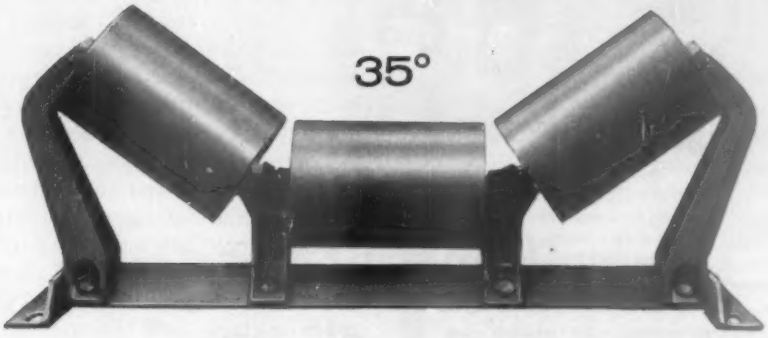


The nebulous problem of noise control was the principal topic at one of the mining meetings. James B. Bowen, assistant to the safety supervisor, Erie Mining Co., Hoyt Lakes, Minn., described his company's highly successful, comprehensive program for audiometric testing, employe education, protective ear plug fitting, and medical treatment if necessary. And James H. Botsford, noise control engineer for Bethlehem Steel Co., called on all users of jackhammers, drills, crushers, trucks, generators and similar rackety equipment to pressure manufacturers into finding means of muting it.

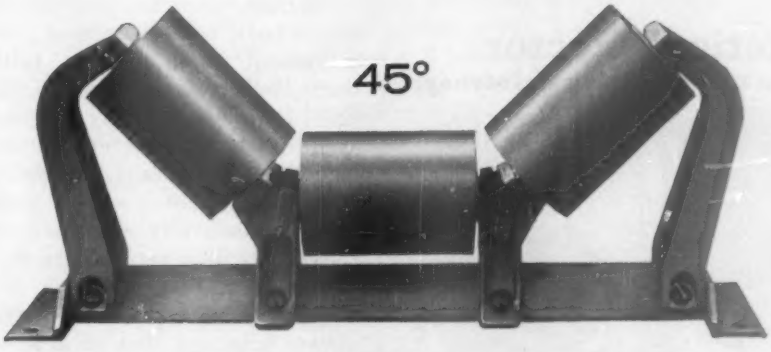
Officers for the coming term were presented by retiring General Chairman Fred E. Storch, Whitehall Cement Mfg. Co., Cementon, Pa. They are: General Chairman—Howard F. Johnston, Funkhouser Mills Div., Ruberoid Co., Hagerstown, Md.; First Vice Chairman and Program Chairman—Dorse O. Seiple, Jr., Standard Slag Co., Youngstown, Ohio; Second Vice Chairman—Arvid Tienson, Materials Service Div., General Dynamics Corp., Lyons, Ill.; and Secretary—J. R. Treadaway, Vulcan Materials Co., Birmingham, Ala. END



which PERMASEAL® idler



is best for your job?



There's a PERMASEAL Idler to perfectly match your belt conveyor requirements. A broad line, plus skilled engineering help, enables you to select the idler that exactly meets your needs. No need to over- or under-design. Power requirements are minimized. Double, flexible diaphragm seals keep grease in the rolls, dirt out. Protect bearings for years. Accurate roll alignment and rugged construction provide long maintenance-free life for idlers, as well as conveyor belts.

PERMASEAL Medium Duty Idlers are available with end rolls inclined at 20°, 35° and 45°; Heavy Duty Idlers at 20° and 35°. In addition to the standard troughing idlers shown here, the PERMASEAL line includes Picking Belt Idlers, Impact Absorption Troughing Idlers, Flat Belt Carrying Idlers and Return Idlers—all types and sizes, for general and extra-heavy duty service. PERMASEAL Idlers handle belt widths up to 72".

Call your nearest Jeffrey distributor, or write for Belt Idler Catalog 996. The Jeffrey Manufacturing Company, 935 North Fourth St., Columbus 16, Ohio.

JEFFREY

If it's conveyed, processed or mined, it's a job for Jeffrey

Enter 1216 on Reader Card

how COLUMBIA ingenuity and armor-tough manganese steel crusher parts increased production 30%, jaw life 75%, on rugged Utah job...

This detailed case history describes amazing accomplishments for Salt Lake County, in Columbia Field Report No. 501. Send for your Free copy.

FIELD REPORT

Columbia's complete line of ARMOR-TOUGH crusher parts provides more wear where it counts, where rock meets metal. For greater production, longer life, specify COLUMBIA.

Columbia

COLUMBIA STEEL CASTING CO., INC.
933 N.W. Johnson, Portland 9, Oregon

Enter 1240 on Reader Card

Magnetic Detector

Stop Tramp Iron Before It Costs You Money!

DINGS Low-cost Universal Series Metal Detectors . . .

. . . signal the presence of all magnetic metals which pass thru the Detector Search Coil. Low power consumption. Simple in design. Requires no attention. Place the search coil around the belt . . . plug into any single phase outlet and turn on the switch — for *automatic* tramp iron protection.

Write for Bulletin 1901-B.

LET Dings DO IT!

DINGS MAGNETIC SEPARATOR CO.
4773 W. Electric Avenue, Milwaukee 46, Wisconsin

MD-161

Enter 1241 on Reader Card

Rocky's Notes

continued from page 24

in this book) clays are studied for their crystal lattice structures, because this is what most concerns their characters. Thus, ceramic chemists are able to identify and use clays for special types of ceramic ware, and to make mixtures to produce the results they want. Chapter by chapter the various kinds of ceramic ware are described and the kinds of clay necessary to make them. These do not include portland cement, although refractories and refractory cements used to line kilns, etc., are described. It may well be that this new text on ceramics contains nothing of direct application to the manufacture of portland cement as at present practiced. It does contain analyses of clays and definitions of terms equally applicable to portland cement manufacture, but the description of products and the method of manufacture are of course outside our province.

The thing that impresses us is the extent of the knowledge accumulated on clays for practical use—not merely mineralogical studies as are most texts on clays—and the lack of such knowledge on the part of the portland cement industry, although clay is a most important ingredient or component in portland cement raw mixtures. Silica in its various forms is also an important raw material for ceramic products, and the discussion of silica in this book, we believe, is of practical significance to cement manufacturers (although of course there are now many texts on silica that are helpful.) In a similar way feldspar and nepheline syenite, which are commonly used fluxes to provide the glassy phase, are discussed. They serve the same purpose in cement manufacture, and we see no reason why what has been learned about them by ceramic researchers should not be helpful to cement researchers.

Cement chemists and researchers such as Bogue always point out that when it is possible to select the source of argillaceous or clay raw material, that a considerable difference in clinkering efficiency may be had. Probably a study of clays from that angle would be aided by reading this book on ceramics. Also, the chapter on refractories might prove helpful in selecting kiln linings, etc. Our author says that: "The synthesis and study of single crystals is now an important part of basic research on ceramic materials. Single crystals are needed for studies of structure and to measure fundamental properties." True, the cement industry has done similar research on clinker crystals. Couldn't it also profit from such research on its raw materials? There are a lot of unexplained phenomena in the operation of a rotary cement kiln. **END**

"Armco Dredge Pipe Gives Us 22½% Longer Life..."

Steel

Rugged
Durable
Economical

This was the comment made by Dunbar & Sullivan Dredging Company officials when asked why they chose Armco Dredge Pipe over other available pipe.

As an example of Dunbar & Sullivan operations, the company recently used 1000 feet of 22-inch I. D. Armco Pontoon Pipe in 40- and 80-foot lengths to widen the Louisville-Portland Canal from 200 feet to 500 feet.

For your dredging operations, Armco not only supplies a complete range of diameter and wall thicknesses—the right one for the materials you're handling—but all necessary pipe specials to match the entire job requirement.

For more information, send the coupon for Armco's newest folder on Dredge Pipe. Find out how you, like Dunbar & Sullivan, can get "more yardage at less cost."

Send Armco's New Dredge Pipe Folder

Armco Drainage & Metal Products, Inc., 7951 Curtis Street, Middletown, Ohio

Name_____

Company_____

Title_____

Street_____

City_____ Zone_____ State_____

Telephone_____

ARMCO Drainage & Metal Products

Enter 1231 on Reader Card

WHEN SO MUCH DEPENDS ON YOUR TIRES...

COUNT ON FIRESTONE TO SEE YOU THROUGH!

Mount Firestone Super Rock Grip Deep Tread tires on your hard-pushing quarry trucks—and watch downtime take a licking. The only tread design of its kind, this tire's 50% deeper tread is made of Firestone Rubber-X, tough enough to fight off cuts and bruises in the ruggedest off-highway going. And, because this tough tread extends through to the cord, you get a wearing-base bonus in recaps.

Its Shock-Fortified nylon cord body, too, staves off schedule-disrupting impact breaks. For on-the-job service and quarry tires at their best . . . naturally, you'll see your Firestone Dealer or Store.

Firestone

Always Specify Firestone Tires When Ordering New Equipment

Copyright 1961, The Firestone Tire & Rubber Company

Enter 1215 on Reader Card

TRUCK TALK

by Chet Cunningham

Are you looking for extra traction these days to keep going on boggy or winter-devastated haul roads? The answer may be the "big brother" V-belt tandem drive.

It is a high traction, low-stretch V-belt that links the powered axle of your truck to the unpowered axle. This transforms the free rolling wheel into a driven wheel, with all the advantages of a tandem drive differential but at a fraction of the cost. The belt rides snugly between the dual tires, gripping the V-shaped grooves of special sheaves.

This belt goes "on-drive" under a tension of 600 lb. The maker says that many present V-belt drives need 1,600 lb. initial tension to offset high stretch.

What good is a V-belt drive? The maker claims: better traction in all weather conditions, smoother, safer, more uniform power and brakes, safer downhill traction, improved tire mileage, lower costs per mile compared with tandem-axle differential drive and overall smoother riding. They say that the belt acts as a shock absorber between axles, lessening shock to gears, axle shafts and clutch.

Do you have a driver selection program? Finding qualified and emotionally responsible drivers is one of the most important aspects of any business where trucks are concerned.

To find applicants, most truck fleets pick new drivers from employe referrals, want ads, posters, etc. But it is after you have your applicants that your work really begins. We can't completely cover the selection of drivers here—books have been written on the subject. However, we can point up its importance and urge you to get some of these books, or call on professional personnel testing and selection help within your city.

Here are some selection hints:

- Use written applications, as complete as it is possible.
- Have personal interviews, watch for indifference, inattention, indolence, arrogance, recklessness or hostility. Hard to spot? Sure, but trained men can do it, and it pays off. Eliminate bad-risk applicants at each step.
- Use a standard intelligence test. The American Transit Association has one. Determine the intelligence level you need.
- Medical examination—make it tough; include vision, hearing, chest X-Ray and electrocardiogram. Weed out poor risks here.
- Remaining men should fill out personal histories in detail.
- Have final interview with reaction-loaded questions and comments.

You'll be lucky to have 15 percent of the original applicants left. But you will have the best 15 percent, the men who most likely will do a good job for you, and who will be happy to stay with you. Driver selection is not an exact science; the more and better professional help you can use in testing, the more sure you can be of getting the best driving talent available. Trouble in driver selection now prevents bigger driver trouble later.

Keep a pressure cap on your cooling system. Many trucks will run fine without a pressure cap, but when the going gets tough—long hills, heavy loads, hot weather—then is the time when that pressure cap pays off. Under pressure, water has a higher boiling point. That means your radiator can take care of more heat without a boil problem. So if your rig is designed to use a pressure cap, keep one on it. END

FOR DEPENDABILITY
PLUS ECONOMY
REPLACE WITH
INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on
INDIAN BRAND
MANGANESE STEEL

Shovel Dippers • Dipper Teeth
Shovel Treads
Crusher Jaw Plates
Mantles • Concaves
Bowl Liners • Roll Shells
Pulverizer Hammers
Grate Bars • Breaker Plates
Ball Mill Liners • Screen Plates
Misc. Manganese Steel Castings

THE FROG, SWITCH AND
MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

Enter 1237 on Reader Card

A NEW BOOK BY
JAMES A. NICHOLSON
GIVES YOU
THE SCORE

"Ready Mixed Concrete," is an historical, authoritative account of one of the fastest growing industries in the world.

Written especially for people in the *Ready Mixed Concrete Industry* the book is a harvest of factual information on every fundamental phase of the business.

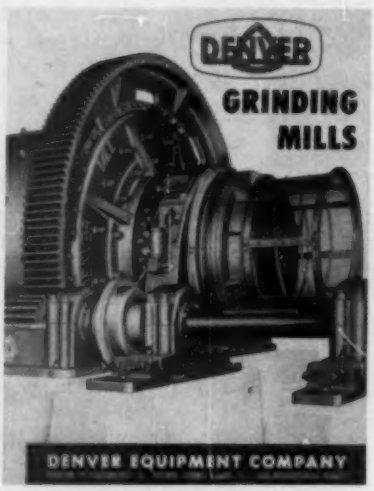
Give a copy to every employee who has a hand in YOUR reputation for quality mixes, and in YOUR profits. Order your copies today.

Single copies only $5.00 each. Five to Twenty copies $4.00 each.

ROCK PRODUCTS
79 WEST MONROE STREET
CHICAGO 3, ILLINOIS

NEW LITERATURE

For free information on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue



Ball and rod mills

Denver Equipment Co. has announced its new publication entitled "Grinding Mills." It is a comprehensive, detailed, 50-page coverage of the company's line of ball and rod mills. Included in the catalog is a complete index outlining the data contained therein on both ball and rod mills. Thorough descriptions of the various design features which combine to make these mills accompany a 2-page data and specification sheet. A circular slide rule is enclosed for estimating ball mill size or capacity.

Enter 600 on Reader Card

Speed changer

Allis-Chalmers Mfg. Co. describes design features of its speed changer that provides dependable variable speed in a new bulletin. Available in five case sizes, ranging from 1 to 30 hp., the speed changer provides speed changes within standard speed ranges of 2 to 1 through 10 to 1, at operating speeds from 1.8 to 4,660 rpm.

The bulletin tells how a choice of mechanical, electrical and pneumatic control options can afford a wide degree of versatility in measuring process or product variables by means of standard sensing and signalling devices.

Enter 601 on Reader Card

Earthmoving equipment

Euclid Div. is offering a 20-page booklet covering the company's complete line of earthmoving equipment. The pocket-size folder contains illustrations and condensed specifications on 2 models of crawler tractors, 8 scrapers, 9 rear-dump haulers and 3 bottom-dump models. Views of the company's plants in Cleveland and Hudson, Ohio, and Lanarkshire, Scotland, are also included.

Enter 602 on Reader Card

Vibrating screens

Kolman Mfg. Co. has released a 16-page, illustrated catalog on the company's line of vibrating screens. Single, double and triple-deck screens are described. A section on screen installation is included along with a listing of such features as: vibrator box, screen frame, screen cloth deck, vibrator mechanism, tension bar assembly, spring assembly and bearing assembly. A complete listing of accessories are given, plus conveyor-to-screen assemblies and detailed specifications.

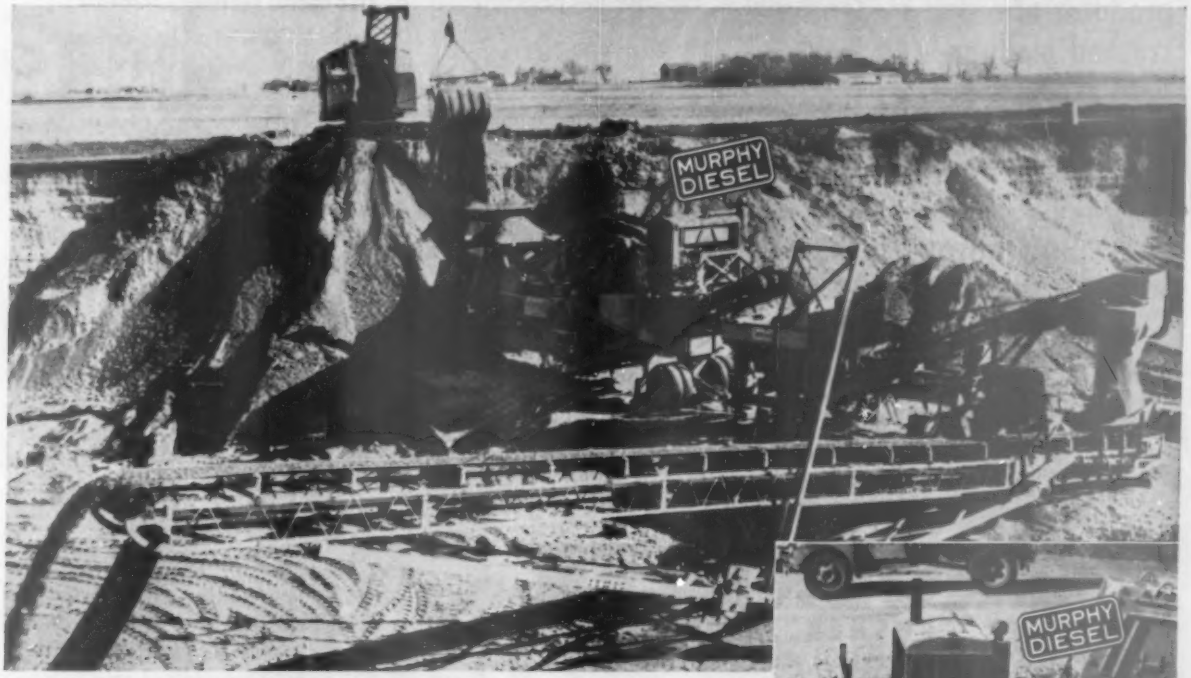
Enter 603 on Reader Card

Please turn to page 124

HERE'S HEAVY-DUTY WORKING POWER BY

MURPHY DIESEL

FOR A 2-MILLION TON PER YEAR AGGREGATE PLANT



A 133 HP (continuous) Murphy Diesel powers a Cedarapids Commander crushing plant in Larson's George Pit, near Joliet, Ill. This plant produces approximately 2200 tons of road aggregate per day.

Elmer Larson, Inc., of De Kalb, Illinois, one of the Midwest's largest aggregate producers, has produced around 25 million tons in the past 30-odd years. Owners Elmer and Leon Larson know the value of equipment that is engineered for *hard work*, with dependability and economy. That's why they chose Murphy Diesel power for the plants shown here.

Murphy Diesels give you the kind of *usable, hard-working* power you need, delivered into the job. Murphy power takes hold of a load and really hangs on. Murphys' good lugging power is the result of high rising torque. This helps keep your equipment at the right operating speed for efficient production and more profit. And Murphys get every ounce of power out of every drop of fuel. When you see your Murphy Diesel Dealer for proof, ask about low maintenance and economical operation, too.

At the Sears Pit, Sycamore, Ill., a 203 HP (continuous) Murphy Diesel powers a Cedarapids Double Impeller Impact Breaker primary. This pit produces 1700 tons per day of road rock, aglime, concrete aggregate, and stone chips.

MURPHY DIESEL 430-N

HEAVY-DUTY POWER FOR CONSTRUCTION

Murphy Diesel engines and power units are available in sizes from 105 to 420 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 70 to 227 K.W.

MURPHY DIESEL COMPANY

5315 W. Burnham St., Milwaukee, Wisconsin

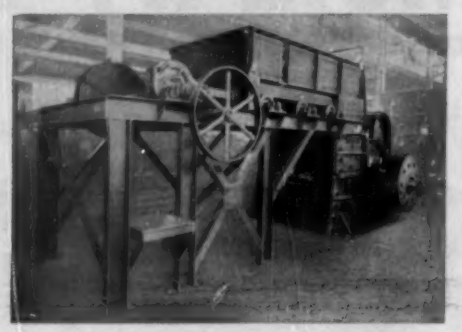
SALES . . . PARTS . . . SERVICE

Throughout the Nation

Enter 1221 on Reader Card

GRUENDLER'S 76th YEAR — MANUFACTURERS OF QUALITY BUILT REDUCTION MACHINERY

High tonnage producer of crushed medium hard limestone and dolomitic type stone



DEPENDABLE HEAVY DUTY SINGLE ROTOR IMPACT HAMMER CRUSHER with Heavy Plate Type Feeder

"Established in 1885"

The heavy plate type feeder handles the large size rock and feeds evenly to the impact hammer crusher. Unit embodies tremendous strength and has a protective tramp metal catcher, assuring an ordinary lifetime of economical crusher service. Let us know about the analysis of your stone and your tonnage requirements and complete information (without obligation) will be sent to you. Also Manufacturers of Jaw Crushers, Hammermills and Material Handling Equipment for handling metallic and non-metallic rock formations, granite, basalt and hard type materials.

GRUENDLER

GRUENDLER CRUSHER and PULVERIZER CO.

DEPT. R. P. 12-61 2915 N. Market St. St. Louis 6, Mo.

Enter 1261 on Reader Card

THE COST OF PRODUCTION PER YARD IS WHAT COUNTS

NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

It's the amount of material passing through a pump that wears out parts. Figure your production cost per yard per hour and you will find "Telltale" the most economical as well as the most productive of pumps.

AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION

"Telltale" is the only pump that warns when it's time to reline. Air sucked through periphery ports causes pump to lose its prime. Pumping stops. Water leaking through the ports signals that the shell liner and the surrounding belt of packing have worn through.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

PEKOR IRON WORKS, INC.

ESTABLISHED 1892

LOCK DRAWER 909 FAIRFAX 2-4020 COLUMBUS, GEORGIA

Enter 1262 on Reader Card

New Literature

continued from page 122

Horizontal vibratory screens

COMCO Corp. has released a two-page specification sheet that describes specifications, dimensions, weights and product features of the company's binder system horizontal vibratory screen. The sheet includes dimension drawings and a photograph of the screen.

Enter 604 on Reader Card

Guidebook to automation

General Electric has published a catalog that offers a comprehensive, thorough presentation of the company's concept of a logical, step-by-step approach to automation through modernization. The publication encompasses programming, data logging, computer control, islands of automation, modernization, basic tools and basic plant areas. Also discussed are quarrying, crushing and storaging; raw grinding, proportioning and blending; burning; finish grinding; packing, and shipping routines.

Enter 605 on Reader Card

Solid lubrication— theory and practice

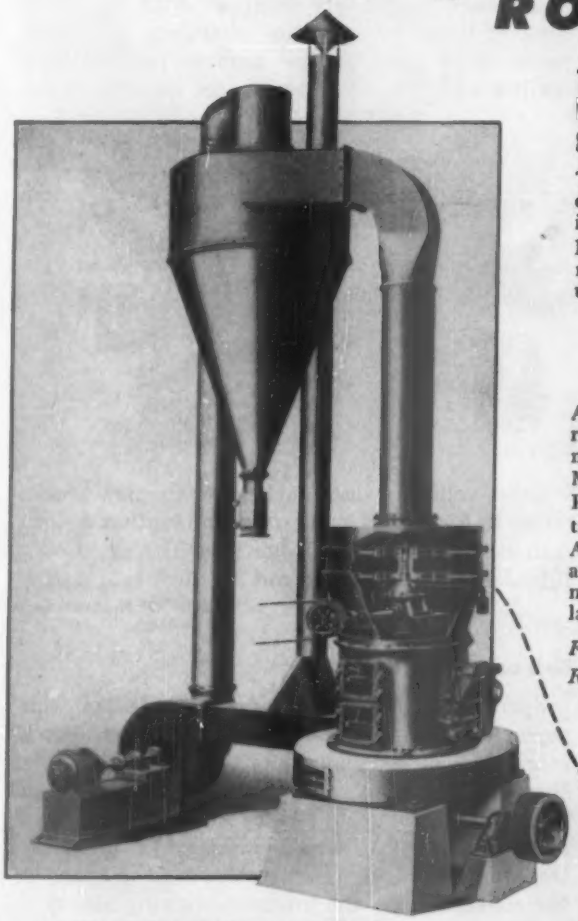
The Alpha-Molykote Corp.'s 8-page, four-color brochure discusses the theory and use of solid lubricants. Titled "Breaking Lubrication Barriers," the brochure discusses such barriers to effective lubrication as galling and seizing, extreme pressures, high friction, chemical reaction, temperature and extreme environments, and describes how solid lubricants can solve them. The properties of molybdenum disulfide as a dry-film lubricant, including chemical stability, electrical and magnetic properties, thermal stability and coefficients of friction are presented in detail. The brochure is illustrated with photographs, charts, graphs and line drawings.

Enter 606 on Reader Card

END

roll up new production... and profit...records

with **Raymond ROLLER MILLS**



RAYMOND MULTI-PURPOSE ROLLER MILL WITH DOUBLE WHIZZER AIR SEPARATOR

Top performing RAYMOND Multi-Purpose ROLLER MILLS with WHIZZER AIR SEPARATION lead the field in fine grinding in the CHEMICAL and PROCESS INDUSTRIES.

This Mill combines the Raymond High Side Roller Mill and the double Whizzer Separator to afford great versatility and economy in the handling of many fine grinding problems.

Its wide scope of application covers the preparation of powdered materials . . . from simple fillers to fancy chemicals. Typical products pulverized include . . .

PIGMENTS • FULLERS EARTH • INSECTICIDES • IRON OXIDES • TALC • BARYTES • KAOLIN AND CLAYS • SULPHUR • CARBON MIXTURES • STARCH • LIMESTONE • BAUXITE • CALCIUM SILICATE •MINERAL FILLERS • PHOSPHATE ROCK • GYPSUM.

A single, easy adjustment of the Whizzer controls the fineness range from 20-mesh grades to products essentially all minus 325-mesh.

Mill capacities reach 40 tons per hour and more with a Super Roller Mill. Flash Drying Accessories may be installed when moisture removal is required.

All aspects of Fine Grinding are combined in a clean, dust-free, automatic system that is economical in operation and maintenance. Installations are flexible and readily adaptable to any plant layout.

For detailed information send for the Raymond Roller Mill Catalog Number 79 Q

Mills are available with Single or Double Whizzer Separators. Whizzers have set of radial blades attached to a disk that revolves on a vertical shaft in separating chamber. Variable speed drive insures finger-tip control of fineness.

COMBUSTION ENGINEERING, INC.

Raymond Division

Combustion Engineering-Superheater Ltd.
Montreal, Quebec, Canada

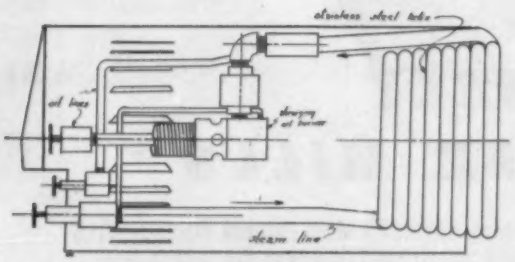
427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

Sales Offices in all Principal Cities

Enter 1213 on Reader Card

NEW MACHINERY

For free information on these ideas, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue



Oil burner improvement

Hydro Burner is the designation of an oil burner with exceptional thermal efficiency. The manufacturer states that it can burn virtually any grade of fuel oil available and still yield better results than conventional oil burners.

A 5-month test at a western cement plant yielded fuel savings of nearly 21 percent and a production increase of 6 percent while maintaining clinker quality.

The burner operates on the steam atomizing principle. One or two oil atomizers receive superheated steam from a spiral helix of stainless steel tubing. These nozzles are mounted in the small end of the volute carrying steam back to them. The high temperature steam thoroughly mixes with the fuel; at the same time the vapor apparently dissociates into its hydrogen and oxygen components. This phenomenon could explain the exceptional effectiveness of the system.

It is possible to fire sludges and low grade fuels. Any fuel is burned without depositing carbon, without using excess air and with very little maintenance attention. (Utah Hydro Corp., 150 East 7th South, Salt Lake City 11, Utah)

Enter 200 on Reader Card

Dodge trucks for 1962

This manufacturer's line of new 1962 trucks for the rock products industry places design emphasis on increased drive comfort, handling ease and improved operating economy. While the exterior appearance of the heavy duty models remains unchanged for the second straight year, these new trucks offer the clean, distinctive look of contemporary styling.

Seven diesel engines are offered in the 1962 truck line. A closed crankcase ventilation system is standard on all heavy duty gasoline engines and optional for all others. This feature prolongs engine life and reduces air pollution in the vicinity. All gasoline models are equipped with an alternator system to maintain charging at idling speeds. A solenoid starter assures positive cold weather starting, according to the manufacturer.

Gross vehicle weight ratings on the new trucks range to 53,000 lb. and gross combination weight ratings to 76,800 lb. (Dodge Div. Chrysler Corp., 7900 Joseph Campau, Detroit 31, Mich.)

Enter 201 on Reader Card

Belt conveyor idlers

Springflex is the name of a style of belt conveyor idler of unconventional design. The idler is fabricated of a heavy-duty, high carbon steel spring that forms a catenary to support the loaded belt. Advantages claimed for the new design include the ability to adsorb impact at loading and transfer points and thus protect the carcass of the conveyor belt, the inherent training ability of the idlers and greatly increased idler capacity for a given belt width.

A number of styles and types are offered with 4 and 5-in. diam. rolls in 20, 35 and 45-deg. troughing. All may be interchanged with virtually any make of standard idlers. (Hughes-Tyler Mfg. Co., 2701 Titan Rd. Littleton, Col.)

Enter 202 on Reader Card

Please turn to page 128

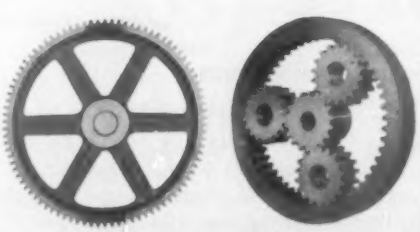
D. O. JAMES... HEAVY-DUTY GEARS
for the rock products industry

What are *your* spur gear and pinion requirements?

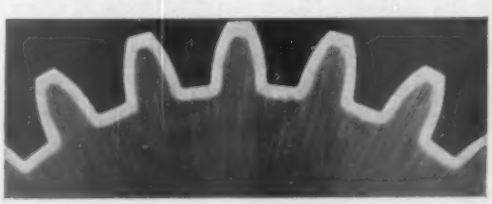
Whether your power transmission requires round-the-clock operation or ability to absorb severe shock loads, D. O. James heavy-duty spur gears and pinions will mesh smoothly, quietly, dependably.

Balanced tooth hardness and toughness built into each D. O. James gear is determined by individual load characteristics of your operations. Spur gear sizes range from ¾ in. to 145 in. dia, 24 DP to ¼ DP.

When you need any type of cut gear . . . at the right price . . . and on schedule . . . call your D. O. James representative. Or, contact the factory direct, outlining your requirements.



D. O. James full-tooth-contour heat-treatment hardens tooth surfaces to 740 Bhn; refines cores from 200 to 260 Bhn for optimum gear service.



D. O. JAMES GEAR MANUFACTURING CO. 761
1140 West Monroe Street, Chicago 7, Illinois
Since 1888, every type of gear and gear speed reducer

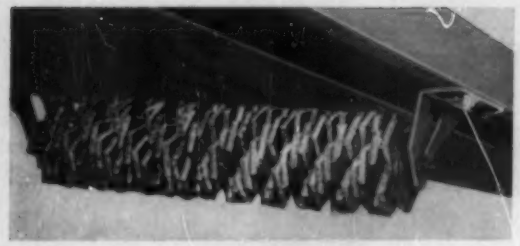
D.O.James

...where you always get good gearing

Enter 1268 on Reader Card

New Machinery

continued from page 126



Self-cleaning return idler

Wet and sticky materials in the rock products industry may now be handled on belt conveyors with the confidence that there will be no buildup on the return run. This is the promise of a newly offered return idler that has built up an impressive service record handling iron ore in Minnesota.

The new Belt Saver Cleaning Idler is an assembly of X-shaped pieces of resilient material mounted spirally on the idler shaft. This produces cleaning action that effectively removes sand, limestone fines and clayey materials from the surface of the conveyor belt. Flexing of the idler and centrifugal forces acting together clean the idler and prevent any build up of material on it.

The 6-in. diam. idler fits in standard idler brackets and is available for all belt widths. (Webster Mfg. Co., Tiffin, Ohio)

Enter 203 on Reader Card

Plastic for crusher cavities

An epoxy resin compound is offered to rock products producers as a highly effective substitute for zinc backing material. Plastic Pack is a liquid plastic that sets to a resilient and non-shrinking solid. It is easily poured into the space between the head and mantle or top shell and concave ring of a gyratory crusher and no extensive preparations are necessary. An 11-lb. kit will fill the same volume as about 52 lb. of zinc. When set and cured for 24 hr., it has a compressive strength of about 16,000 psi. (Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.)

Enter 204 on Reader Card

Hardfacing alloy electrode

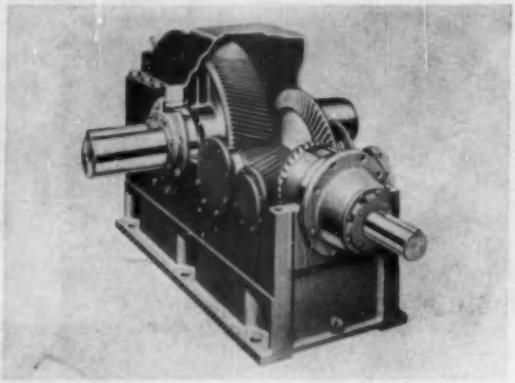
Whenever a hard, machinable hardfacing is required, Alloy 97 is offered to do the job. This new electrode for submerged-arc hardfacing offers hard, tough and check-free deposits for general purpose work. Single layer and multi-layer deposits range between 50 and 54 Rockwell C but when machined with carbide tipped tools, hardness increases to 62 Rockwell C. (Coast Metals Inc., Little Ferry, N.J.)

Enter 205 on Reader Card

Heavy-duty reducers

Two complete lines of rugged, heavy-duty speed reducers are offered for the severe operating conditions in the rock products industry. Each line has 22 standard sizes, assuring precise and economical selection for almost every application.

One is Type Y with parallel input and output shafts. The other is Type YB featuring a right



angle helical bevel gear set at the input shaft. Ratios of the parallel shaft reducers range between 1.84 to 1 and 292 to 1; Ratios of the right angle reducers range between 5.06 to 1 and 1,207 to 1.

All units have housings with smooth, flat surfaces that assure simple, easy mounting of motor brackets, backstops and other accessories and modifications. Heavy, double-ended shafts have large diameters to accommodate maximum torque and high overhung loads. The shafts may be reversed in the housing to present a new gear face and thus extend the life of the gears. Continuous, positive lubrication is provided with oil-tight, dust and waterproof shaft seals. (The Falk Corp., Box 492, Milwaukee 1, Wis.)

Enter 206 on Reader Card

Intercom for high noise areas

A new industrial intercommunication system has been designed especially for the high noise level areas in rock products plants. The completely transistorized system is ideal for use in screen houses, mill buildings and crusher areas.

Only one unit for each station will do the job for both speaking and hearing while a single knob controls the volume. Units may be located close together or several miles apart. All that is needed is a 2-wire connection between each one. Current required is either 12v. dc. or 117v. 60 cy. ac. (Atkinson Dynamics, 10 W. Orange Ave., South San Francisco, Calif.)

Enter 207 on Reader Card

Please turn to page 130

"That SECO TWIN BEARING SCREEN of ours just won't bog down...

...and we use it for scalping!"

says Joe Taylor, Plant Superintendent, West Roxbury Crushed Stone Co., West Roxbury, Mass.

West Roxbury Crushed Stone Company has used nothing but SECO Screens for the last 12 years but they have never been more enthusiastic about any screen than they have been about their SECO TWIN BEARING. "You normally would expect to bog down a 2-bearing screen if you use it for scalping off + 2¼" stone and you're running at capacity all season long," said Mr. Taylor.

"But that SECO TWIN BEARING keeps on screening, and giving us real efficiency, even when we overload it," he continued.

Then Mr. Taylor added "Another reason we buy SECO Screens exclusively is that we always get right advice the first time on what kind of screen we need for a specific job."

Isn't this the kind of screening satisfaction that you need in your plant?

Investigate the benefits of SECO TWIN BEARING Screens soon!

SEND FOR FREE BOOKLET TB-21

SECO
PRODUCER PROVEN
VIBRATING SCREENS

SCREEN EQUIPMENT CO., INC.
Buffalo 25, N. Y.

Enter 1289 on Reader Card

move heavy tonnage FAST

with powerful-high speed • dependable

BULK CONVEYORS

Move it *fast* . . . at low cost! You can do both with CSI-Farquhar, the greatest name in portable bulk conveyors. There's a machine for every purpose in our complete line of trough conveyors—permanent and portable.

CSI-Farquhar can show you economies, low maintenance and dependability which you can count on, year in and year out. Ask your CSI-Farquhar dealer or representative to give the details on how to move tonnage fast—at low cost!

SEND FOR COMPLETE BULK PORTFOLIO
Complete file on the CSI-Farquhar line. Will help you get the right conveyor for the job—Ready Mix Sand Gravel Rock Coal or any other bulk material

CSI Farquhar CONVEYORS

A. B. FARQUHAR DIVISION
CONVEYOR SYSTEMS, INC.
6485 Main Street, Morton Grove, Illinois
Phone: YOrktown 6-7700 • Chicago Phone: JUniper 8-0200

Enter 1247 on Reader Card

New Machinery

continued from page 128

Bag handling belt

A Netherlands belt manufacturer has introduced a package handling belt with a cleated surface. This is said to make it possible to handle bags up an incline of 35 deg. from the horizontal.

Because of the unusual design of the cleats that are an integral part of the body of the rubber belt, they are able to maintain a firm grip on the material handled.

The belts are offered to meet American standards for pulleys, idlers and accessory parts and it is not necessary to redesign or rework existing inclined conveyors to accommodate the new belt. Standard widths include 16, 20, 24, 28, 32 and 48-in. belts. (Voss Belting & Specialty Co., Inc., 5645 N. Ravenswood Ave., Chicago 26, Ill.)

Enter 208 on Reader Card

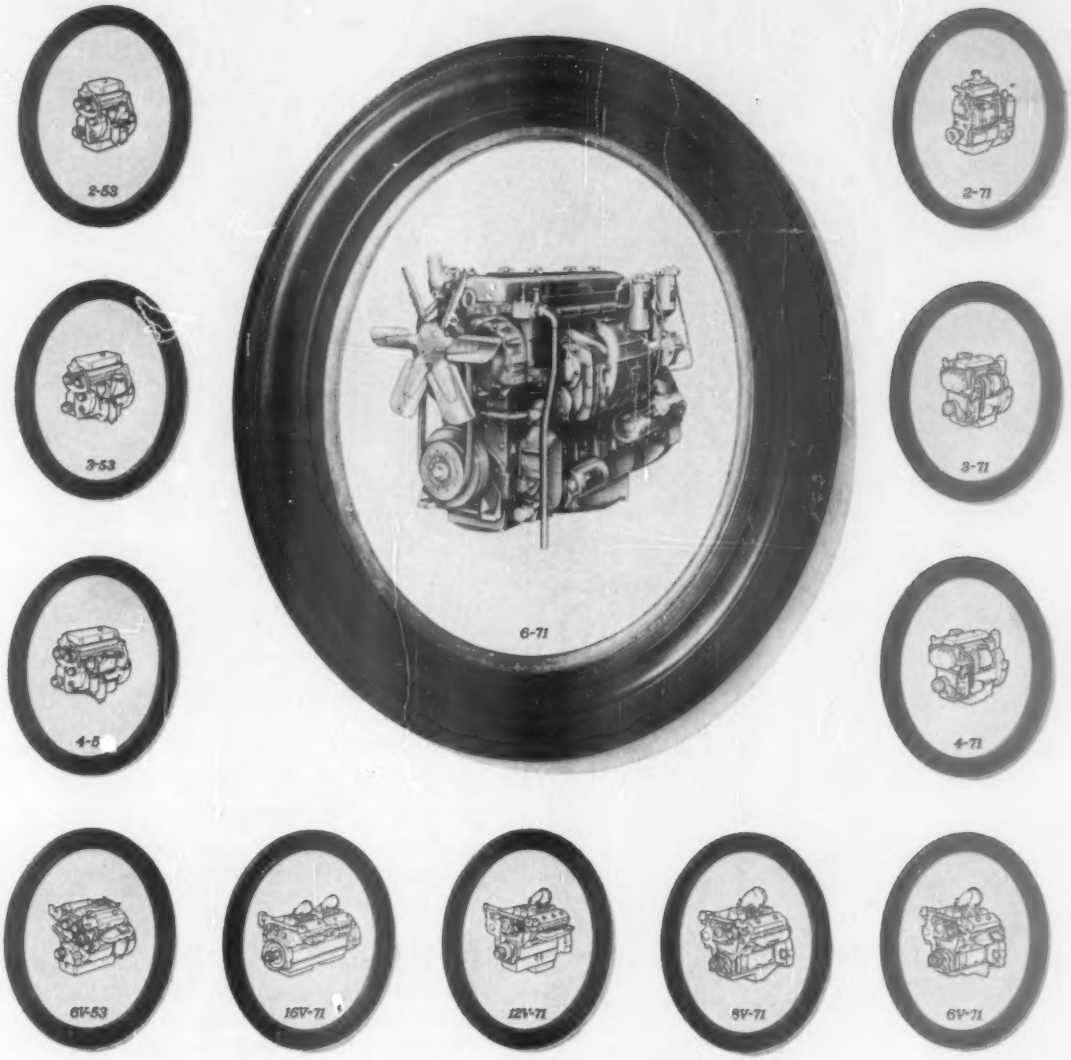
Wet cyclone dust collector

Aeromix is the name of a wet scrubber of unconventional design reported to offer high dust collection efficiency without pumps, nozzles or filters. The extremely simple design of the cone and collecting tank prevents plugging, reduces the resistance through the unit and conserves makeup water.

The unit is made up of a long tapered cone capped with radial, stationary fins that are enclosed in a collecting hood. Dust-laden air or gases are admitted through the throat of the cone. At the same time, scrubber liquid flows from a separate collecting tank into the throat at the bottom of the cone through a tangential orifice. The stream of liquid is entrained in the air stream and the extreme turbulence in the cone breaks the liquid into minute drops. At the same time, dust particles are trapped in the turbulence and are carried up to the collecting tank.

Stationary fins or vanes impart a rotary motion to the stream of dust and moisture laden gases and the slurry is taken out of the air stream by centrifugal forces. The slurry is drained to a col-

Please turn to page 132



All in the family

A full power Diesel line—20 to 1008 h.p.—built to just *one basic design.*

That's the unique GM Diesel *family of engines concept*—the big difference in Diesel-powered equipment today.

Here's how it can make a big difference in your power and profit picture.

One design gives you lowest-cost parts and service, with *unmatched interchangeability of identical parts.*

One design (job-proven by over 90 million horsepower) lets the latest power advances be added without sacrificing reliability and long life—gives you greater value in *every* engine.

One design lets you meet growing horsepower needs merely by moving to the next engine in the series.

Result: The *more* GM Diesels you use, the *more* you profit *per engine.*

That's why, whether you buy new equipment from a manufacturer or repower the equipment you now have, it will pay you to *specify* GM Diesel. Detroit Diesel Engine Division, General Motors, Detroit 28, Michigan. (In Canada: General Motors Diesel Limited, London, Ontario.)

GM DIESEL

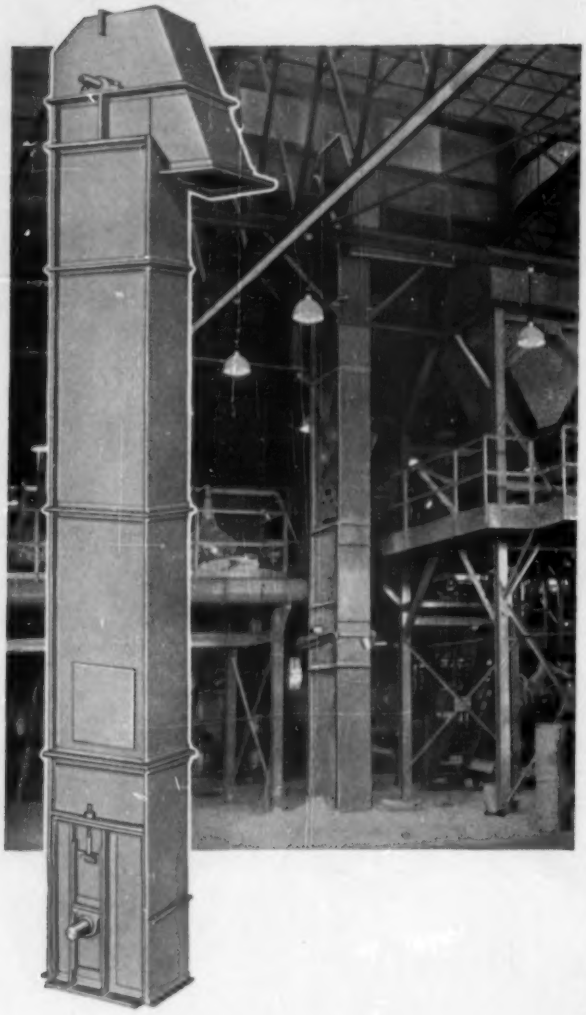
SERIES 53 & 71 ENGINES

One proven design throughout the line builds greater value into every engine

Enter 1214 on Reader Card

EHRSAM for continuous

LOADABILITY!



Engineers who specify conveying systems today demand quality – equipment proven to speed processing and maintain continuous material flow. They look beyond price to design and craftsmanship. An Ehrsam bucket elevator adapts to existing equipment for easy installation. Dramatically increases productivity. Ehrsam frees you from critical design and fabrication costs and bears the responsibility for efficient operation throughout its useful life. Behind quality is management's "no-orphan" policy . . . Ehrsam refuses to abandon one piece of equipment in productive use. Ehrsam supplies a wide range of products to fit your material flow pattern . . . at your desired pace . . . for increased profits. Call one of the seven district offices below for complete information.

The J. B. EHRSAM & SONS MANUFACTURING CO.

ENTERPRISE, KANSAS

DISTRICT OFFICES | Kansas City, Kansas / Denver, Colorado / Chicago, Illinois
Fort Worth, Texas / San Francisco, California
Phoenix, Arizona / Hastings, Nebraska

EI 2-461

Enter 1263 on Reader Card

New Machinery

continued from page 130

lecting tank where a portion is diverted to waste and the rest is recycled through the system. A concentration of ½ to 1 lb. of solids per gallon is maintained and makeup water is estimated at only 8 to 12 times the weight of solids actually collected. Standard capacities of the new scrubber range between 1,500 and 33,200 cfm. of dust laden air or gases. (Aerotec Industries Inc., Greenwich, Connecticut)

Enter 209 on Reader Card

Oil filter cartridge

Diesel lubricating oil systems present unusual conditions for maintaining a clear, clean lubricant. High density filters seem to reduce the rate of flow and starve the lubrication system while other filters seem to have a relatively short effective life.

A new filter is said to represent a real breakthrough in filter design that offers high flow rate, long filter life and visibly cleaner lubricant. This has been achieved by meticulous control over the filter materials including control of the density and stability of the filtrant. (Wix Corp., Gastonia, North Carolina)

Enter 210 on Reader Card

Heavy-duty flexible coupling

A new line of heavy-duty flexible couplings for slow-speed service has been designed especially to resist the attack of chemicals, oils and moisture. Coupling bodies are made from semi-steel castings, while the retaining bolts and other fittings are made from stainless steel. Bakelite cushions have been processed to resist swelling or distortion.

Capacities of the new couplings range from 2.6 to 1,365 hp. at 100 rpm., while bore sizes are available up to 9½ in. (Lovejoy Flexible Coupling Co., 4938 W. Lake St., Chicago 44, Ill.)

Enter 211 on Reader Card

Variable-speed drives

Rock products producers may now match the horsepower needs of driven equipment in the fractional horsepower range with a motorized variable-speed drive. A series of new drives is available from ¼ through ¾ hp. with variable-speed ratios from 2:1 to 10:1 to offer control of small feeders, conveyors and rotary gates.

With integral motors and large, easily operated manual controls, the new units are said to be lighter and more compact than other drives. (Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.)

Enter 212 on Reader Card

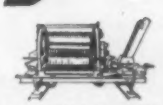
Please turn to page 134

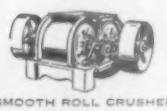
GRINDING FOR LESS THAN 1¢ A YARD The Featherlite Company of San Antonio, Texas, relies on an American #9 grinder for reduction of 130,000 cubic yards of expanded shale annually. J. B. Bell, plant manager, states, "The American #9 is best for this type of grinding. Maintenance is very low, in fact, our total grinding costs are less than 1¢ a cubic yard. This is amazing since our material has a 68% silica content and is extremely abrasive. We produce over one million lightweight blocks annually and sell the balance of the lightweight aggregate in the San Antonio area."

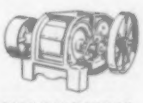
In addition to low maintenance, the grinder features wet or dry grinding, no screen plates required, suspended mullers are adjustable to volume and size requirements, gears are long-wearing cast material, only 25 horsepower required, volume up to 30 cubic yards per hour.

Do Your Job The AMERICAN Way

American
CLAY MACHINERY


ELECTRIC CUTTERS


SMOOTH ROLL CRUSHERS


DISINTEGRATORS

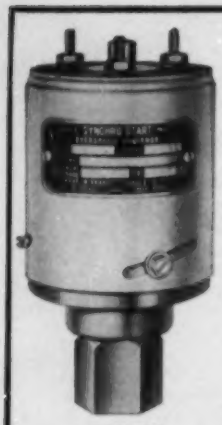
PUG MILLS

GRINDERS

DE-AIRED COMBINED MACHINES

DIVISION OF
HUBER-WARCO COMPANY · Marion, Ohio, U.S.A.

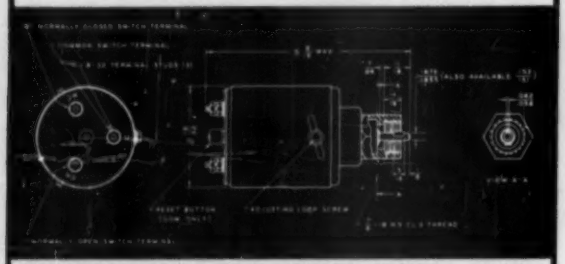
Enter 1212 on Reader Card



MODEL GO

SPEED SENSITIVE SWITCHES

That can be furnished to trip at any given speed between 300 and 6000 R.P.M.
These switches have single pole, double throw, snap-acting contacts rated for 10 Amps at 115 V.A.C. A variety of dust covers and electrical connectors are available if exposed terminals are undesired.



SYNCHRO-START PRODUCTS, INC.
8151 N. RIDGEWAY AVENUE • SKOKIE, ILL.

Enter 1278 on Reader Card

T.C. WRITE FOR CATALOG 56

DURABLE ECONOMICAL WOVENWIRE SCREEN KNOWN AROUND THE WORLD

TWIN CITY IRON & WIRE CO.
35 W. WATER STREET • ST. PAUL 7, MINNESOTA

Enter 1279 on Reader Card

Slurries... *handled at lower cost*

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

Buy WILFLEY for Cost-Saving Performance

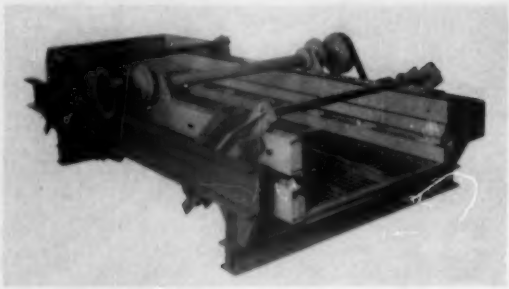
A. R. WILFLEY and SONS, Inc.
Denver, Colo., U.S.A.

WILFLEY centrifugal PUMPS

Enter 1280 on Reader Card

New Machinery

continued from page 132



Low-cost horizontal screen

A newly developed horizontal vibrating screen features the lowest headroom requirement of any double deck screen. At the same time, it transmits less vibration to the supporting structure than all except other screens in the maker's line. With low price the Kobold screen retains many advanced design features, including a positive eccentric drive and natural rhythm shear block springs. (Comco Corp., 5421 Lancaster Ave., Philadelphia 31, Pa.)

Enter 213 on Reader Card

Dust collector for high temperature gases

A new venturi scrubber subjects high temperature exhaust gases to a double scrubbing action and removes dust particles as small as .05 micron with better than 99 percent efficiency.

First scrubbing takes place in the throat of each venturi as the dust-laden gases pass through a bell-shaped wall of spray water. A second scrubbing action occurs as the stream of gases passes through an inverted spray cone formed as the first spray rebounds from the belled mouth of the venturi.

Advantages claimed for the new scrubber include lower power costs, lower operating expenses and low water requirements. (Buell Engr. Co. Inc., 123 William St., New York, N.Y.)

Enter 214 on Reader Card

New twist in torque wrenches

A new high-capacity torque wrench makes it easy for a mechanic to apply just the right amount of torque needed. When the preset torque has been reached, a sensory signaling device sounds a tone and imparts a pulse to the operator's hand. Of course, there is a visible scale for checking the accuracy of the signal.

The S600 instrument has a capacity of up to 600 lb.-ft. torque with a direct reading scale. This torque may be achieved by one man exerting only

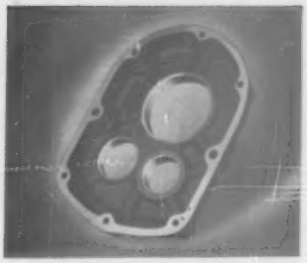
Please turn to page 136

...the quality-engineered package

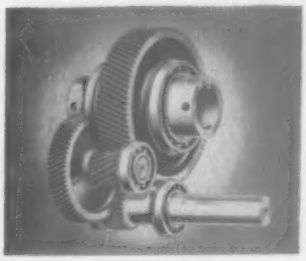
that simplifies speed reduction

DODGE TORQUE-ARM, America's most widely used shaft mounted speed reducer, will save money for *you.* No foundation, no sliding motor base, no flexible coupling, no installation fuss. Developed and perfected by Dodge, this reducer has been so widely accepted in industry that it is now built and stocked in this unmatched range of sizes and models: capacities up to 170 hp; output speeds from 10 to 400 rpm; ratios of 5:1, 15:1, 25:1; speed ratios up to 175 to 1 with correct selection of speed reducer and V-belt drive. Built-in backstop available. Also positive overload release. Vertical models. Flange mounted models. Special application models... Go modern—go Torque-Arm! See your Dodge Distributor, or write us.

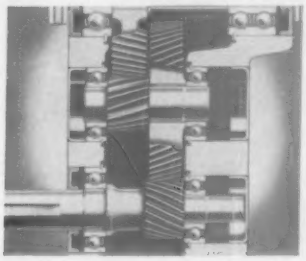
Dodge Manufacturing Corporation, 2600 Union St., Mishawaka, Ind.



Rugged, semisteel housing holds bearing seats in line for entire life of unit. Laughs at loads. Corrosion resistant.



AGMA rated helical gears. Soft cores withstand shock; hardened surfaces defy wear. Teeth are crown shaved.



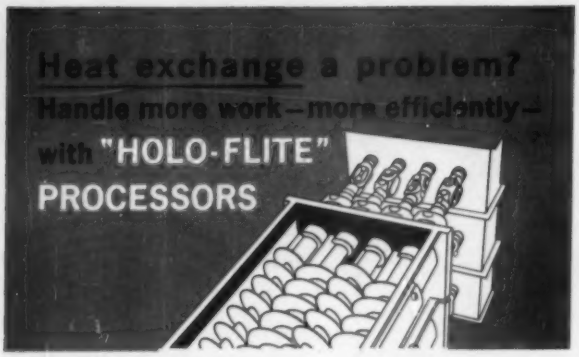
Gears are located *between* bearings and carry their loads without strain. Longer life, higher efficiency.

Unit slides completely onto shaft and locks on *both* sides of housing. This baby stays *put*—runs truer longer.

The Products with the Pluses... **DODGE** ***of Mishawaka, Ind.***

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Look under "Dodge Transmissioneer" in the *white* pages of your phone book. Factory trained by Dodge, he can give you valuable assistance.

Enter 1269 on Reader Card



The secret is **continuous** bulk flow operation — far faster and more efficient than batch processing. Heating or cooling fluid circulates through the hollow shaft and flights of a conveyor screw, thus processing granulars, fluids, or sludges as they flow along. Gentle conveying action minimizes particle degradation and dusting. Broad operating range. Heats to 500°F; cooling range, 1800°F to 0°F. Multiple "Holo-Flite" tiers can be stacked for high capacities in minimum floor space.

FREE LITERATURE. Write today to Western Precipitation, 1000 W. 9th St., Los Angeles 54, Calif. (In Canada, write 8285 Mountain Sights Ave., Montreal, P. Q.)

WESTERN PRECIPITATION

DIVISION OF JOY MANUFACTURING COMPANY

Enter 1281 on Reader Card

A NEW BOOK BY

JAMES A. NICHOLSON

GIVES YOU THE SCORE

"Ready Mixed Concrete," is an historical, authoritative account of one of the fastest growing industries in the world.

Written especially for people in the Ready Mixed Concrete Industry the book is a harvest of factual information on every fundamental phase of the business.

Give a copy to every employee who has a hand in YOUR reputation for quality mixes, and in YOUR profits. Order your copies today.

Single copies only $5.00 each
Five to Twenty copies $4.00 each

ROCK PRODUCTS

79 WEST MONROE STREET CHICAGO 3, ILLINOIS

Enclosed is my check (money order) for $.....Please send at once ..... copies to:

RP-1061

NAME .....

COMPANY .....

STREET .....

CITY ..... ZONE .....

STATE .....

Enter 1282 on Reader Card

New Machinery

continued from page 134

120 lb. of pressure. Weighing only 17 lb., the unit has a quick-disconnect center section for easy shipping or storage. A number of adapter ends are available to suit a wide range of bolts, screws and sockets. (The P. A. Sturtevant Co., Addison, Illinois)

Enter 215 on Reader Card

New conveyor belt

Nylock 170 is the designation of a newly developed conveyor belt designed especially for general industrial applications. It has no fabric plies to separate. Instead, it is built up from heavy cables of long-staple cotton, interwoven with high-strength nylon into an integral unit. This construction results in a belt of great strength, shock resistance and tear resistance.

With a tension rating of 17 lb. per in. of width, the belt is ideal for handling aggregates, sized crushed stone, gypsum and silica when premium-grade belts are not needed. (The B. F. Goodrich Co., 500 S. Main St., Akron 18, Ohio)

Enter 216 on Reader Card

Oil level alarm switch

A new low-level alarm switch has been specifically developed to detect any drop in the oil level of bearings. This is a simple, rugged unit particularly designed for outdoor service. It requires very little maintenance, according to the maker.

A mercury switch in a normally closed circuit trips when the lubricant falls below a predetermined point. The circuit stays open until the oil rises to its normal level. (Oil-Rite Corp., 2320 Waldo Blvd., Manitowoc, Wis.)

Enter 217 on Reader Card

Electric motor insulation

Seal Flex is a breakthrough in electrical insulation for motors, according to the manufacturer. Its development is sure to bring big changes in the electric motors used in the different segments of the rock products industry. The new insulating material is a reinforced, non-woven polyester mat that is coated with a flexible epoxy resin. As a result, it provides a coating for the coils of a motor that has high dielectric strength, chemical resistance, moisture resistance and high abrasion resistance. These are basic for the wet conditions in washing plants and dry, abrasive conditions. (Electric Machinery Mfg. Co., Minneapolis 13, Minn.)

Enter 218 on Reader Card

END

Open to all Producers and Users of Sand, Gravel and Ready Mixed Concrete

NATIONAL READY MIXED CONCRETE ASSOCIATION — 32nd ANNUAL CONVENTION

NSGA NATIONAL SAND AND GRAVEL ASSOCIATION — 46th ANNUAL CONVENTION

NOW
UNDER ONE ROOF

COMBINED

Biennial Show

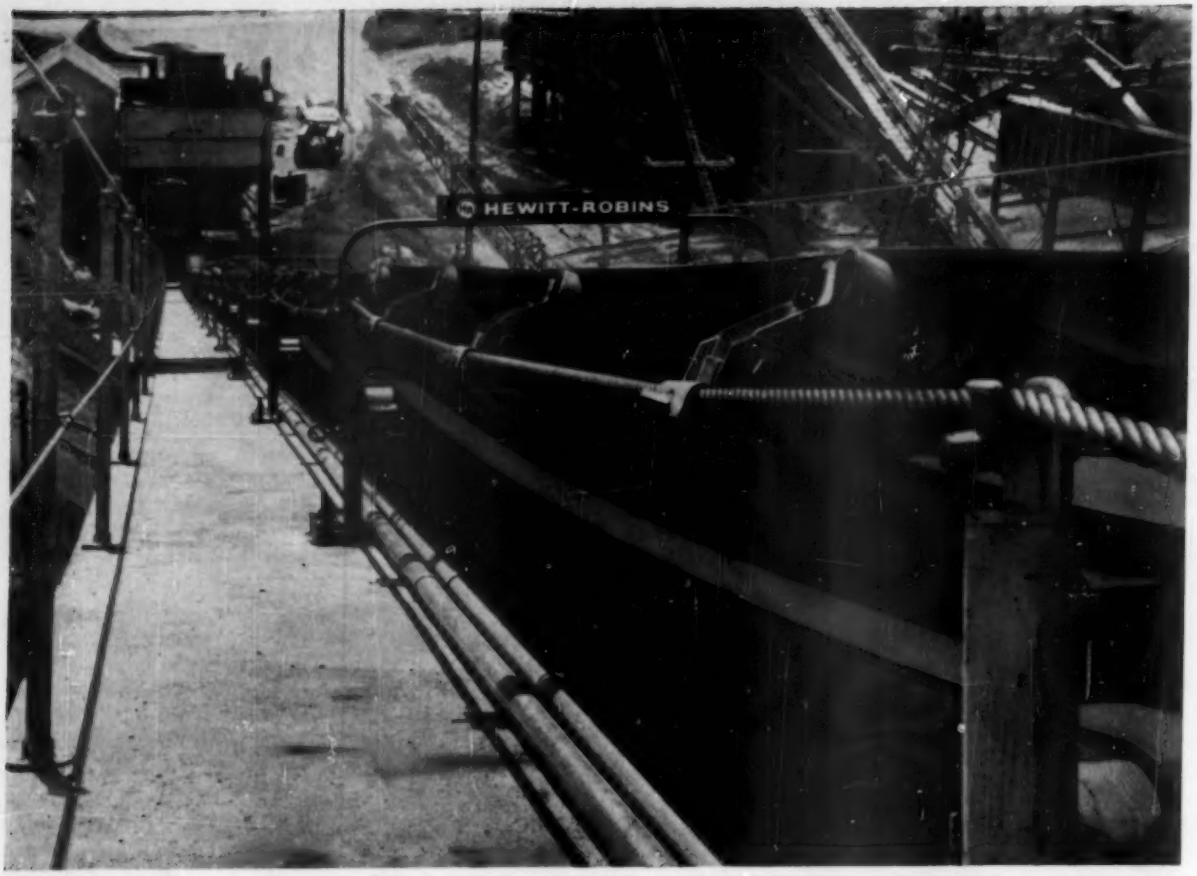
Magnificent new McCormick Place Exposition Center
CHICAGO · FEBRUARY 5-8, 1962

FREE registration and admission to users as well as producers of sand, gravel and ready mixed concrete.

- **ACRES OF NEW IDEAS.** More than 160 blue ribbon exhibitors. New equipment. New methods. New ideas. All to help you cut costs . . . increase efficiency and profits.
- **FREE TIME TO SEE SHOW.** No convention meetings all day Monday . . . or Tuesday and Wednesday afternoons. Plenty of time to see all exhibits, exchange ideas, talk with friends and business associates.
- **FREE, FAST TRANSPORTATION** between Conrad Hilton and McCormick Place. Buses scheduled every 3 minutes during rush hours. Every 10 minutes throughout each day.
- **EXCELLENT DINING FACILITIES.** No need to hunt for a place to eat. McCormick Place has three restaurants and one cafeteria. Large, modern. Prompt service, excellent food.

PLAN NOW TO SEE THIS GREAT COMBINED INDUSTRIES SHOW

Enter 1220 on Reader Card



Down go your costs with an H-R Wire Rope Conveyor!

Here is the simplest, most efficient conveyor construction you could imagine . . . an H-R wire rope conveyor. The initial cost is significantly less than other constructions. New H-R Style L idlers (pat. pend.) and wire rope design allows 13% greater load-carrying capacity, absorbs shock and impact, and thus increases belt and idler life and lessens spillage considerably.

Engineering costs are kept to a minimum because H-R modular designed components fit together like building blocks. This allows greater flexibility in selecting a conveyor for a specific application without intricate engineering.

Another point in your favor; H-R is the only manufacturer of *both* belt and major machinery components of a conveyor. This single-source responsibility is your best assurance of quality.

See an H-R wire rope conveyor in action . . . above or below ground; call your H-R field engineer, or write Hewitt-Robins, Stamford, Connecticut to arrange an inspection tour.

Write for complete facts, installation data. Bulletin "12-19"

HEWITT-ROBINS

Conveyor Machinery and Belting • Power Transmission
Hose • Processing Equipment • Engineering Services

Enter 1219 on Reader Card

READER-SERVICE CARD

RP-12-61

ROCK PRODUCTS
79 W. Monroe St.

DECEMBER, 1961
Chicago 3, Illinois

Cannot be serviced after February 1, 1962 postmark.

Please print or type

Name_____ Position_____

Company (In Full)_____

Company Address_____ City_____ Zone____ State_____

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

(1) ..... (2) ..... (3) ..... (4) ..... (5) .....

(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

BUSINESS REPLY MAIL
No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

– POSTAGE WILL BE PAID BY –

ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

BUSINESS REPLY MAIL
No Postage Stamp Necessary If Mailed in the United States

FIRST CLASS
PERMIT NO. 1417
CHICAGO, ILL.

– POSTAGE WILL BE PAID BY –

ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

READER-SERVICE CARD

RP-12-61

ROCK PRODUCTS
79 W. Monroe St.

DECEMBER, 1961
Chicago 3, Illinois

Cannot be serviced after February 1, 1962 postmark.

Please print or type

Name_____ Position_____

Company (In Full)_____

Company Address_____ City_____ Zone____ State_____

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

(1) ..... (2) ..... (3) ..... (4) ..... (5) .....

(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

MONEY-MAKING IDEAS FOR YOU---FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.

WHY THE GROWING SHIFT TO FULLY AUTOMATIC TRUCK TRANSMISSIONS?

Performance is the answer.

For instance, engines last 33⅓% longer, brake linings last 50% longer, trip time is cut an average of 18%.

Driver recruiting and training expenses are sharply cut, axles and drive-lines run longer, engine-disconnect clutch repairs are eliminated, and gas mileage is improved for many truckers.

Proof? Nicholson Concrete Co. of Toledo gets two to three new customers each year with its automatics.... Fix Materials Co. in St. Louis saves 10 minutes every hour... 3 trucks do the work of 4 for New Jersey Silica Sand.... Stout Construction Co. in West Virginia saves $1,348 a year on just one truck.

Why not get the percentages going for you, too? Get an Allison fully automatic transmission in your next truck. Call your dealer today or mail the coupon for more information.

Allison Division of General Motors
Dept. RP-12, Indianapolis 6, Indiana

Please send me the 12-page color brochure describing Allison Fully Automatic Truck Transmission.

Name.....

Title.....

Company.....

Street Address.....

City..... Zone..... State.....

Allison Fully Automatic Truck Transmissions are now available in:

CHEVROLET — POWERMATIC

DIAMOND T — ALLISON AUTOMATIC

DODGE — TORQMATIC

TRANSMATIC

REO — REOMATIC

WHITE — WHITE Allison AUTOMATIC

Enter 1285 on Reader Card

MANUFACTURERS NEWS

S-A announces new vibrating conveyors

Stephens-Adamson Mfg. Co. announced availability to industry of natural-frequency vibrating conveyors, with constant capacity or variable from zero to maximum, at a conference and plant tour (Aurora, Ill.).

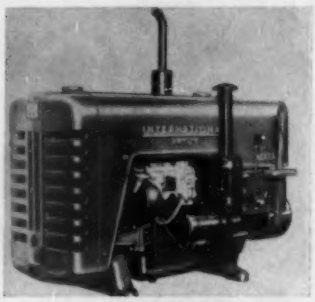
The "natural-frequency" feature embodies the use, in a vibrating conveyor, of reclaimed energy created by the natural-frequency vibration of coil springs. Once the springs reach the point of vibration at their natural frequency, they regenerate much of their own power with little outside energy required to keep them operating. Power to drive the units is supplied by an electric motor through a positive stroke drive, which controls the constant rate of vibration and prevents dampening of conveyor action under heavy loads.

In particular, Stephens-Adamson demonstrated what they thought to be the longest conveyor of this type ever built—nearly 300 ft. Also demonstrated was a dynamic balanced unit equipped with a variable stroke drive, which may be used as a controlled vibrating feeder. Infinitely variable capacity between zero and maximum may be obtained on this unit when it is in motion by manually or automatically varying the length of stroke, but maintaining the frequency of vibration. The variable stroke feature makes possible adaptation of the unit for feeding, bagging, drying, cooling, de-watering or other similar applications.

German diesel imports

International Harvester Co.'s Construction Equipment Div. has begun importation of small, German-built diesel engines in five power sizes. The units are products of the company's subsidiary firm in Neuss, West Germany, where diesel engine manufacture has been carried on since 1949. Addition of these engines, ranging from 2 to 4 cylinders, gives the company a line of diesels that ranges all the way from 66 to 817-cu. in. piston displacement.

The engines supplement the International line and do not replace any existing U. S.-built engines. They are direct-starting, valve-in-head, sleeved engines with 19.1 compression ratios, and range from 15.8 to 39.6 maximum horsepower. They are designed with interchangeable connecting rods, main and connecting rod bearings, valves, valve



springs, push rods and rocker arm assembly components. The crankcase for all five engines is machined from three basic blocks; pistons and sleeves are of two sizes.

Hewitt-Robins buys Lippmann Engr. Works, Inc.

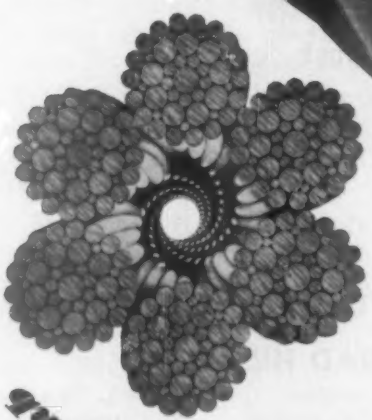
An agreement has been reached that the business and equipment of Lippmann Engr. Works be acquired by Hewitt-Robins.

Incidentally, Lippmann's name on page 94 has been incorrectly designated. It is now Lippmann Engr. Works, Inc. After the first of January it will be operated as Lippmann Products Div.

Please turn to page 145

Enter 1236 on Reader Card

We put a lot of work into it— You get a lot of work out of it



Quality inside and outside

Here are two "close-ups" of Roebling Royal Blue Wire Rope which show in part where your savings come from . . . uniformity of structure. Invisible, but equally important, is Royal Blue's *extra* high tensile strength. All the way through, Royal Blue pays off for you on every kind of wire rope job. Find out more from your wire rope distributor, or write for free booklet to Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation.

NATIONAL CRUSHED STONE ASSOCIATION

45TH ANNUAL CONVENTION
AND
MANUFACTURERS DIVISION EXPOSITION

CONRAD HILTON — CHICAGO, ILL.
FEBRUARY 12 - 13 - 14, 1962

✦

AN EXCEPTIONAL OPPORTUNITY FOR

- Manufacturers of Machinery, Equipment, and Supplies used in the Crushed Stone Industry to display their products under the most favorable and economical circumstances

- Producers of Crushed Stone to see the latest developments in Machinery and Equipment and to consult with Technical Representatives of the Manufacturers

✦

ALL CONVENTION AND EXPOSITION ACTIVITIES WILL TAKE PLACE UNDER ONE ROOF AT THE CONRAD HILTON

PLAN NOW TO ATTEND

✦

For further information write to

National Crushed Stone Association

1415 Elliot Place, N. W., Washington 7, D. C.

Enter 1218 on Reader Card

continued from page 142

Colo. Fuel & Iron appointments

The directors of The Colorado Fuel & Iron Corp. have elected Leonard C. Rose, formerly executive vice president, as president and a director. Alwin F. Franz, who has been president since 1952, was named chairman of the board. Charles Allen, Jr., who has served as chairman since 1945, will maintain his association with the corporation as chairman of the Executive Committee. Mr. Rose will have responsibility for administering and operating the corporation.

St. Regis Paper hosts tour

Members of the rock products industry met with management and sales personnel of St. Regis Paper Co.'s Bag Div. during a recent tour of the company's bag plant at Franklin, Va. The guests were shown how the multiwall bags they use to package their products are made—from storage of rolled kraft paper, through the various manufacturing processes, to bundling and shipping operations.

Special courses in automatic control offered by Honeywell

Minneapolis-Honeywell's Philadelphia-based Instrumentation Education Center is offering two special courses, "Control Dynamics" and "Fundamentals of Instrumentation," in addition to regular services and maintenance classes. Since 1935, when the school was founded, it has been attended by more than 6,000 "students" from 33 countries representing every major industry and many government agencies. Control systems that are growing in size and complexity in the industrial areas, and the urgent need for highly trained instrument technicians and specialists have prompted enlargement of the curriculum.

"Control Dynamics" is a 5-day course for instrument and systems engineers covering nonmathematical techniques for evaluating process dynamics in solving automatic control problems. Sessions for 1962 will be held April 9-13 and October 1-5. "Fundamentals of Instrumentation," is a 10-day course to be held three times during the year —March 5-16, June 18-29 and October 22-November 2. It is primarily for engineers with little or no instrument experience and for those needing to review the principles of conventional instrumentation.

Please turn to page 146

Tailor-made to give you more efficient blasting! **BEMIS EXPLOSIVES BAGS**

Bemis Explosives Bags for ammonium nitrate and nitro-carbo-nitrate are tailor-made to your requirements—to give you more efficient blasting.

More economical: Use of Bemis Explosives Bags and ammonium nitrate mixtures can save up to 50 percent on explosives costs.

Easy to fill: Bemis provides technical assistance, manufactures equipment to speed up bag filling.

Wet hole or dry hole . . . you'll get top efficiency at minimum cost with . . .

Bemis Burlap Bags with heavy-duty polyethylene liners. The rugged burlap absorbs the punishment of handling or jagged holes. Poly liner provides waterproofness.

Other Bemis Explosives Bags:

Flexiply® Bag with poly liner. Here three plies of rugged creped wet-strength kraft provide the toughness.

Laminated Bags. Constructions of burlap, kraft paper, polyethylene and pliofilm—in varied combinations—are all performing satisfactorily in the pits and on construction sites.

Write today for sample bags and additional information on Bemis Explosives Bags.

Bemis

Where packaging ideas are born

General Offices—408-M Pine Street, St. Louis 2

Enter 1287 on Reader Card

continued from page 145

Explosives Engineer terminates

The Explosives Engineer magazine which served the explosives-consuming industries has terminated its activities with the publication of the November-December 1961 issue. The magazine has been published regularly by Hercules Powder Co. since 1923. It has reported new methods of handling explosives, new techniques in mining, quarrying, road building, seismic prospecting and land reclamation.

In 1925, the publishers of the magazine conceived the idea of a National Safety Competition for the mineral industry and engaged the sculptor, Bengi del Piatta, to execute the original "Sentinel of Safety" trophy. The bronze trophies, together with the name and the well-known green-and-white safety flags have been given by the magazine to the Bureau of Mines which will continue the sponsorship of the National Safety Competition.

Wheelabrator acquires Criswell Co., Inc.

Acquisition by Wheelabrator Corp., Mishawaka, Ind., of the W. W. Criswell Co., Inc., Riverton, N.J., has been announced by Harold M. Miller, senior vice president of Wheelabrator. The Criswell Co. produces all types of fabricated bags and blankets for filtering solids from gas or liquid streams. The cloths are made from natural and synthetic fibers. Wheelabrator is a subsidiary of Bell Intercontinental Corp.

The purchase for an undisclosed sum of money, includes a new 22,000-sq. ft. facility in Riverton, which was occupied this year. Mr. Miller said the present management, headed by W. W. Criswell, Jr., president and founder, will continue to operate the New Jersey company.

Roebling appointments

Forest S. Burtch has been named general sales manager for John A. Roebling's Sons Div., Colorado Fuel & Iron Corp. He formerly was general product manager for the firm's construction materials division. The appointment was announced by E. George Hartmann, recently elected vice president in charge of sales for the eastern operations of the corporation. A. Lester Patterson succeeded to Mr. Burtch's former position as general product manager for construction materials, and Lloyd E. Hill was promoted to product sales manager.

100'x24" Stacker is one of four Kolman Stackers used in the production of aggregate at Squaw Valley, California, in preparation of roads and site for the 1960 Winter Olympic Games. Stackers in the background are 70'x24".

PNEUMATIC-TIRED STACKERS IN LENGTHS UP TO 150 FEET

Reports of outstanding performance by the Kolman Model 101-R Radial Stacker are rolling in from all parts of the country. Owners are enthusiastic about bonus features offered by the Kolman Stacker — features like cable suspension of the boom, two-position wheels, balanced electric drive on the head section, power lift, power travel, and cam hinge. Sizes up to 150 feet long build larger stockpiles with a single setting.

MINIMUM SEGREGATION

Kolman's cable suspension design eliminates the segregation encountered with stackers having fixed discharge heights. By raising the stacker as the pile is built, the fall of material is kept at a minimum.

MAXIMUM PORTABILITY

Even the largest Kolman Stackers are on dual pneumatic tires that roll easily on any level surface. Wheel assembles are mounted in quick-change frames to easily shift from radial arc position for stacking to parallel position for moving from one location to another in the stockpile area.

150'x30" Stacker shown includes electric power lift and electric power travel for finger-tip control of stacker discharge position.

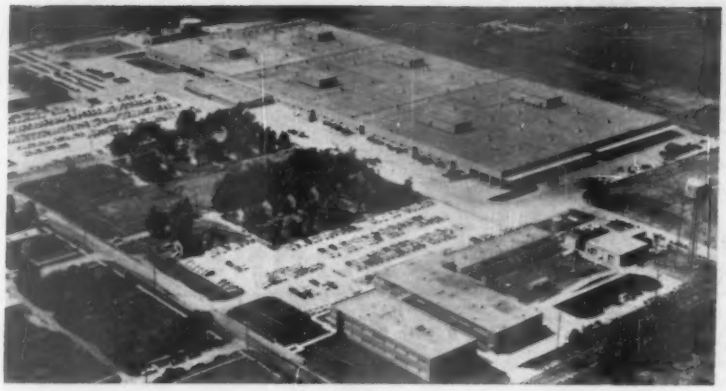
100'x24" Stacker in the background stockpiles sand produced with an 8'x48" double-deck vibrating screen on a Model 101 Kolman Portable Conveyor-Screen Plant.

WRITE FOR LITERATURE

KOLMAN MANUFACTURING CO.

4200 West Twelfth Street Sioux Falls, S. D.

Enter 1288 on Reader Card



Allis-Chalmers commences engine production in new Harvey plant

Production of Allis-Chalmers engines has started in a new 515,000-sq. ft. engine manufacturing facility recently completed at the company's Harvey, Ill., works. A 440 x 1,100-sq. ft. steel and concrete structure houses the company's production equipment. This gives the company an automative-type straight-line production system under which material is fed into the line at one end of the building to emerge as a completely assembled engine at the other end, ready for the final test prior to shipment. The plant has four semi-automatic assembly lines which are capable of producing more than 130 different variations of 4 and 6-cylinder diesel, gasoline, butane and gas engines. A fifth line is manually controlled and from it flow engine-driven electric sets, power units, marine engines and special industrial engines.

Engines currently being produced by the plant are in the 41 to 350-hp. ranges. One of the features is the area for testing engines as they come off the assembly line. Gasoline engines are "hot tested" on 20 stands; diesel engines are checked in 34 test areas. A mobile calibrating cart is used to check the accuracy of each console. Owen J. Higgins is general manager of the new plant. Architect and general contractor was H. K. Ferguson Co. of Cleveland, Ohio.

END

RP BUYER RESEARCH SERVICE

PRODUCER PURCHASING SERVICE *FREE*

QUICK—COMPLETE SOURCE CONTACTS FOR ROCK PRODUCTS PRODUCERS on Machinery—Equipment—Supplies—Service

___Aftercoolers, Air
___Agitators
___Aggregates (special)
___Air Compressors
___Asphalt Mixing Plants
___Bagging Machines
___Bags
___Barges
___Belting, Conveyor
___Elevator, Power Transmission
___Belting, V-type
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Bits
___Blasting Supplies
___Bodies, Trailer
___Buckets
___Bulldozers
___Cars, Industrial
___Classifiers
___Clutches
___Coal Pulverizing Equipment
___Concentrating Tables
___Conveyors
___Crushers
___Coolers
___Cranes
___Derricks
___Dewatering Equipment, Sand
___Diesel Engines
___Dragline Cableway Excavators
___Draglines
___Dredge Pumps
___Drilling Accessories
___Drills
___Dryers
___Dump Bodies
___Dust Collecting Equipment & Supplies
___Electric Motors
___Engineering Service Consulting and Designing
___Explosives & Dynamite
___Fans and Blowers
___Feeders
___Fifth Wheel Heavy Duty Special
___Flotation Equipment
___Front End Loaders
___Gasoline Engines
___Gear Reducers
___Generator Sets
___Grinding Media
___Gypsum Plant Machinery
___Hard Surfacing Materials
___Hoists
___Hoppers
___Kilns: Rotary, Shaft, Vertical
___Locomotives
___Lubricants
___Magnetic Separators
___Mills
___Pipe
___Pumps
___Scales
___Screen Cloth
___Screens
___Scrubbers: Crushed Stone, Gravel
___Shovels, Power
___Speed Reducers
___Tanks, Storage
___Tires and Tubes
___Torque Convertors
___Tractor Shovels
___Tractors
___Trailer Dump Bodies
___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
___Trucks, Motor
___Valves
___Vibrators
___Welding and Cutting Equipment
___Winches
___Wire Cloth
___Wire Rope

If equipment you are in market for is not listed above, write it in space below.

The principal rock product(s) manufactured by my company is/are indicated "1", "2", "3", in order of importance below.
___Crushed Stone
___Sand & Gravel
___Slag
___Cement
___Lime
___Gypsum
___Ready Mix Concrete
___Concrete Products Type_____
Other nonmetallic mineral (What?)_____
All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

Please Check Service Desired
☐ Have Salesman Call ☐ Literature only
☐ Prices ☐ By mail ☐ Urgent

NOTE: See—Where to Buy-Classified Advertising Section for used equipment and complete plant information

Name _____
Title _____
Firm _____
Street & No. _____
City and State _____
Your Signature _____ Title_____

FILL IN—TEAR OUT—MAIL NOW!

BUYER RESEARCH SERVICE DEPARTMENT: ROCK PRODUCTS 79 W. Monroe St. Chicago 3, Illinois

WHERE TO BUY

You may find just what you're looking for in used equipment, employment, professional services and the other opportunities listed. Box numbers are confidential and advertisers' names will not be disclosed. Send replies to: Box Number (shown on ad), c/o ROCK PRODUCTS, 79 West Monroe Street, Chicago 3, Illinois.

"WHERE TO BUY" Classified Ad Space is sold by the column inch. There are 3 columns per page, 10 inches in depth. Columns are 2 7/16 inches wide. Space available in one, two, or three column widths, and up to ten (10) inches in depth, in multiples of even inches only.

Contracted number of issues in 12 issue period and total column inches in each issue, one or more ads, determine charge for each ad.

Insertions in CONCRETE PRODUCTS apply to rate earned ROCK PRODUCTS.

Box numbers in care of our office, and forwarding of replies, are included at no extra cost.

RATES PER COLUMN INCH

Space (Inches)	1 Issue	3 Issues	6 Issues	12 Issues
1"	$14.00	$13.50	$13.00	$12.50
2"- 9"	13.50	13.00	12.50	12.00
10"-19"	13.00	12.50	12.00	11.50
20"-30"	12.50	12.00	11.50	11.00

Published 1st of month. Forms close 12th of month preceding.

Terms: 10 days after receipt of invoice. No agency commission.

Date_____

WHERE TO BUY AD ORDER

ROCK PRODUCTS
79 W. Monroe St.,
Chicago 3, Ill.

Please publish our advertisement, occupying _____ — or more, in _____ issues specified during the 12 month period beginning with _____ issue.

INSERTION SCHEDULE

JANUARY_____	JULY_____
FEBRUARY_____	AUGUST_____
MARCH_____	SEPTEMBER_____
APRIL_____	OCTOBER_____
MAY_____	NOVEMBER_____
JUNE_____	DECEMBER_____

Firm Name _____

Address _____

City, Zone, State _____

Signed by _____

LIQUIDATIONS

1—Raymond #73612 Super High Side 6 Roll Mill, 8' dia. whizzer, complete.
1—Raymond #5047 High Side 4 Roll Mill, 5'6" dia. whizzer, complete.
1—#1 Raymond Impact Pulverizer, 5' dia. whizzer, complete.

AIR SEPARATORS

2—Raymond 16' and 14' dia. single whizzer.
2—Sturtevant 14' dia. with 75 HP motors.

KILNS & DRYERS

1—Link Belt 7' x 45' Rotary Kiln, 3/8" shell.
1—Vulcan 8' x 80' Rotary Dryers, 1/2" shell.
1—Vulcan 7' x 80' Rotary Dryer, 1/2" shell.
2—Fuller 6'6" x 60' Rotary Dryers, 1/2" shell.
1—Vulcan 5 1/2' x 4'1/2' x 60' Rotary Dryer, 3/8" shell.

FULLER-KINYON PUMPS

1—8" type B with 75 HP motor.
1—6" type E with 50 HP motor.
2—6" type H with 30 HP motors.

MILLS-PULVERIZERS

2—Bradley-Hercules 60" Mills with 350 HP.
1—Traylor 7' x 27" Compeb Mill, with 500 HP.
4—Allis Chalmers 5' x 22' Tube Mills, with 200 HP motors.
5—Hardinge 6' x 36", 5' x 22" and 3' x 24" conical Ball Mills, motor driven.

1—Dixie Non-Clog Mogul Hammermill, #5040, 200 HP, with 36" pan feeder.
1—Pennsylvania Super-Thor Hammermill, SXT-13 with 250 HP motor.
7—Fuller Lehigh Mills, 57", 48" and 46" with motors.

CONVEYORS

1—Link Belt Pan Conveyor, 36" wide x 70'6" long, 10 HP.
1—Link Belt 24" x 45" troughing belt conveyor.
1—Jeffrey Traylor 24" x 48" Pan Feeder.

MISCELLANEOUS

4—8' x 12' Feinc Rotary Vacuum Filters.
4—IR Imperial Compressors 884 cfm @ 100 PSI.
3—IR Imperial Vacuum Pumps 4188 cfm.
12—Centrifugal Pumps 4" to 16" with motors.
15—Bucket Elevators 16-49' c.c., continuous and centrifugal discharge, steel casings, drives and motors.
900'—6", 9", 12", and 16" screw conveyors.
20—Steel Hoppers and Bins, 30' x 12' x 15' to 6' x 10' x 12' structural steel supports.
Apron Feeders, Bucket Elevators, Screw Conveyors, Motors, Structural Steel, etc.

BRILL EQUIPMENT COMPANY
35-57 Jabez Street, Newark 5, N. J. Tel: Market 3-7420 N.Y. Rector 2-0820.

ROCK PRODUCTS EQPT. DIV.

8' x 60' x 1/2" Welded Rotary Kiln
6' x 120' x 1/2" Vulcan Rotary Kiln
4' x 35' Rotary Dryer New Shell
4' x 47' x 5/16" Mosser Rotary Dryer
6' x 36" Hardinge Conical Mill 75 HP
8' x 11' Traylor Ball Mill Steel Lined
#5060 Dixie Mogul Hammermill
SX13 Penna. Hammermills, 400 HP
Heil Patterson Crushers, 100 HP
Raymond #50 & #40 Impact Mills
36" x 42" Koppers 2 Roll Crushers
36" x 48"; 20" x 6" Jaw Crushers
3'x3'x12' Horiz.; 4'x9'x12' Vert. Puggers
30"x96"; 60"x84" Screens
Bucket Elevators 45' to 90' Centers
3'x10' Tyler Hummer Screens 1 1/2 HP
10 Ton Gas/Elec, Locomotive 36" ga.

WRITE—WIRE—PHONE

HEAT & POWER CO. INC.
60 E. 42 St. New York 17, N.Y.
MU 7-5280

MODERN EQUIPMENT FOR SALE

Universal Lab. Jaw Crusher 5x6
Sturtevant Lab. Jaw Crusher 2x6
Sturtevant Lab. Rolls 8x5
Traylor 12" Bulldog Secondary Gyratory
Sturtevant #00 Rotary Crusher
Sturtevant #1 Rotary Crusher
2' Symons Std. Cone Crusher
#19 1/2 Kennedy Fine Cone Crusher
Cedar Rapids Jaw Crusher 9x24
New England Jaw Crusher 14x28
Good Roads Jaw Crusher 5x12
Denver Lab. Jaw Crusher 3 1/4 x 4 1/2
Farrel Jaw Crusher 36x18
Farrel Jaw Crusher 24x13B
Wheeling Jaw Crusher 6x12
Universal Vibrating Screen 3x8 S.D.
Leahy 4' x 7' S.D. Screen
Telsmith 3x10 Apron Feeder
24" x 5' Eccentric Plate Feeder
12" x 40' Enclosed Cement Elevator
Reducers up to 250 H.P.
15 H.P. Motor-Reducer Conveyor Drives
50 H.P. Gearmotors 100 R.P.M.
2 to 10 H.P. Gear Motors
Sleeve Brg. Motors up to 30 H.P.—Cheap!
100 H.P. Spencer Turbo, 24 oz.
Garage Compressor 1 1/2 H.P.
Carpullers—3 H.P. & 7 1/2 H.P.
14" to 48" Used Idlers
24", 30", 36" Used Belt—AA-1
Belt Conveyor Tripper 24"
30" Magnetic Pulleys
9" Screw Conveyor complete with Ends, Hangers, Gearmotors (150' Avail.)

G. A. UNVERZAGT & SONS INC.
136 Coit St. Irvington 11, N.J.
Essex 3-8105

ROT. DRYERS—KILNS

10′ x 11′ x 175′ Vulcan Kiln, $\frac{11}{16}$″
10′ x 100′ dryers, ⅜″ welded
9′ x 30′ Link-Belt Roto-Louvre
8′-6″ x 70′ Bartlett & Snow dryers
8′ x 80′ Traylor dryer, ⅜″ welded.
8′ x 60′ rotary kiln, ½″ welded
8′ x 40′ Stearns-Roger dryers, ½″
7′-6″ x 62′ kiln, ½″ welded
7′ x 120′ Allis kiln, ⅜″ welded
7′ x 110′ Bennot kilns, ⅝″ shell.
6′ x 7′ x 100′ kiln, ½″ shell
6′ x 150′ kiln, ⅜″ welded
6′ x 50′ Louisville steam-tube
6′ x 50′ rot. dryer, ⅜″.
6′ x 40′ rot. cooler, ⅜″
6′ x 18′ Link-Belt Roto-Louvre
3′ x 23′ Standard dryer, ¼″

JUST PURCHASED
1—Marcy #64½ ball mill.
1—6′ x 150′ kiln, ⅝″
1—Symons 3′ standard

PERRY FOR KILNS - DRYERS - MILLS

BALL & ROD MILLS

Hardinge 8′ x 48″ conical pebble, 75 HP
Hardinge 7′ x 36″ conical pebble
Allis-Chalmers 6′ x 18′ pebble-tube
Allis-Chalmers 6′ x 16′ ball-tube
Allis-Chalmers 6′ x 12′ rod, 125 HP.
Marcy #64½, 6′ x 4′6″, 100 HP
Allis-Chalmers 5′ x 22′ ball-tube
Bonnot 5′ x 10′ ball-rod mill 75 HP.

CRUSHERS—PULVERIZERS

Symons 2′ standard cone crusher
Symons 2′ shorthead cone crusher
Farrel 36″ x 15″ jaw crusher
Buchanan 24″ x 13″ jaw, 50 HP
Mitchell 18″ x 9″ jaw, 25 HP
Babcock & Wilcox #32E ball type pulv.
Raymond #6659 hi-side mill, 250 HP.
Raymond 66″ 6-roller hi-side mill.
Raymond 50″, 5-roller, hi-side mill
Dixie #5060 hammermill, 500 HP

PERRY

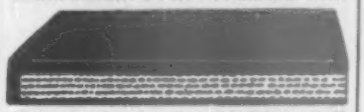
EQUIPMENT CORP.
1418 N. Sixth—Phila. Pa.
Phone POplar 3-3505

BONDED BARGAINS

QUALITY EQUIPMENT AT LOW PRICES
Immediate Shipment From Our Factory
Write, Wire, Phone for Free Catalog

NEW CONVEYOR AND ELEVATOR BELTING AT GREATLY REDUCED PRICES

Guaranteed To Meet Listed Specifications
WE PAY FREIGHT ON 200 POUNDS AND OVER



Major Bee Brand, 16# to 19# Friction Pull, 2400# to 3000# Cover Tensile, Heavy Duty. Molded edges. Skim coat between plies increases adhesion and protects against moisture entering carcass. For high tonnages and abrasion resistance. For hauling stone, mineral ore, concrete, cement, coal, chemicals and other similar bulk materials, both wet and dry.

Width	Ply	Duck	Top and Bottom Covers	Price Per Foot
7″	4	32 oz.	1/32″ x 1/32″	$1.71
9″	5	32 oz.	1/32″ x 1/32″	2.44
12″	3	28 oz.	1/16″ x 1/32″	2.31
12″	6	36 oz.	1/16″ x 1/16″	4.02
14″	4	28 oz.	1/8″ x 1/32″	3.13
16″	4	28 oz.	1/8″ x 1/32″	3.28
18″	3	28 oz.	1/16″ x 1/32″	3.09
18″	4	28 oz.	1/8″ x 1/32″	3.63
24″	3	28 oz.	1/16″ x 1/32″	3.84
24″	4	28 oz.	1/8″ x 1/32″	4.49
24″	5	28 oz.	1/8″ x 1/32″	5.28
30″	4	28 oz.	1/8″ x 1/32″	5.53
36″	4	28 oz.	1/8″ x 1/32″	6.55

Other widths, plies, duck weights and cover thicknesses available at low prices.
WRITE FOR FREE SAMPLE & CATALOGUE #1279

TROUGHING IDLER CONVEYORS

Three different designs offer a wide choice to fit the particular application and budget. All are jig built for quick, easy installation.

BONDED 8″ JR. I-BEAM CONVEYOR. A low cost unit for moderate speeds and capacities. Ideal for low headroom installations above or below ground.

BONDED TRUSS FRAME CONVEYORS. Available in 18″ and 30″ deep frame. Built like a bridge. For heavy loads, higher speeds and capacities, clear spans to 50 feet. This will vary with depth of truss, accessories required, etc.

Conveyor prices include brand new belting, but in two pieces. By using our shorter "roll-end" pieces, we can pass the saving on to you.

A FULL LINE OF ACCESSORIES (brakes, takeups, scrapers, belt covers, etc.) and two lines of special idler types, priced on request.

8″ JR. I BEAM FRAME CONVEYOR

Belt Width	Conveyor Length*	Price	Add or Deduct Per Foot
14″	25′	$ 766	$16.62
16″	25′	786	17.10
18″	25′	830	18.83
20″	25′	871	19.30
24″	25′	922	20.68
30″	25′	1012	23.17
36″	25′	1105	25.91

WRITE FOR BULLETIN #1138

18″ DEEP TRUSS FRAME CONVEYOR

Belt Width	Conveyor Length*	Price	Add or Deduct Per Five Feet
14″	25′	$ 901	$ 94.80
16″	25′	923	97.69
18″	25′	959	102.42
20″	25′	998	109.45
24″		1067	116.24
		1140	129.37

WRITE FOR BULLETIN #1139

*Lengths are center to center of pulleys. For overall length add 1′—6″.
Prices of 30″ Deep Truss conveyors quoted on request.
WRITE FOR BULLETIN #1139.

BONDED SCALE AND MACHINE COMPANY
128 BELLEVUE COLUMBUS 7, OHIO
PHONE: Days, HI 4-2186 Evenings: AX 1-2213

FOR SALE
EUCLIDS: Rear, Bottom and Scrapers
1½ yd. Bucyrus-Erie Shovel
8 yd. Bucyrus-Erie Electric Shovel
9W-Bucyrus-Erie Dragline, 8½ yd.
7W Bucyrus-Erie Dragline, 7 yd.
5W Bucyrus-Erie Dragline, 5 yd.
200W-Bucyrus-Erie Dragline, 6 yd.
170B Bucyrus-Erie Shovel, 6½ yd.
120B Bucyrus-Erie Shovel, 5 yd.
54B Bucyrus-Erie Shovel, 2½ yd.
38B Bucyrus-Erie Shovel, 1½ yd.
80D Northwest Shovel, 2½ yd.
4500 Manitowoc Dragline, 5 yd.
2400 Lima Dragline, 6 yd.
1201 Lima Dragline, 3 yd.
1½ yd. Northwest Shovel
7400 Marion Walking Dragline, 9 yd.
(All sizes, makes, Crawler and walking type)
SHOVELS—DRAGLINES—CRANES
WILLIAM LUBRECHT, III
CONSTRUCTION EQUIPMENT
311 W. Diamond Ave. Hazleton, Penna.
Telephone GLadstone 3-4041 or 5-0253

SECTIONAL RADIATORS
Used Good Condition

These Radiators incorporate the Advantage of Removable Sections for Easy Maintenance. Sections are 6″ wide, 5″ deep and 48″ long. Overall radiator Size is 61½″ x 56½″ x 5¼″. Some with Cast Iron—some with Aluminum Tanks. Former Use: 6 Radiators per each 1800 H.P. Diesel Engine. (For cooling applications only.)

Each unit Steam Cleaned, Flushed and Pressure Tested. Photo Available.

Contact: Ralph Ingram

ZIDELL EXPLORATIONS, INC.
3121 S. W. Moody Ave., Portland 1, Oregon
Phone: CA 8-8691

FOR SALE

Model 2400 Lima Crane, 150 ft. boom, complete with dragline assembly.

71 B Bucyrus Erie Shovel, complete with electric light plant.

54 B Bucyrus Erie Shovel, combination dragline and crane.

All in A-1 Condition

GULL CONTRACTING CO., INC.
&
L. G. DeFELICE & SON
33-15 Lawrence St., Flushing, N. Y.
LEnox 9-7000

FOR SALE
Euclid 3TD Truck, Excellent Condition $8,500
LeT W BT Pull Scraper $8,500
Minnesota Branch, Euclid Division, GMC
3305 Republic Avenue, Minneapolis 26, Minn.
West-9-2646 Sunday (West-9-1129)

JAW CRUSHERS
60″x48″ to 6″x3″
New and used RELIABLE

"Farrel-Bacon" Jaw Crushers

BACON-PIETSCH CO., INC.
26 Park St., Montclair, N.J.
29 Washington Ave., Hamden, Conn.
Phone Montclair—Pi 6-1300

HEAVY EXCAVATION EQUIPMENT
LARGE DRAGLINES, SHOVELS, CRANES, ROTARY DRILLS, EUCLID DUMP TRUCKS
FRANK SWABB EQUIPMENT COMPANY, INC.
Hazleton National Bank Building, Hazleton Pa.
Phone GL 5-3658

WHERE TO BUY

continued . . .

WE OWN THE EQUIPMENT
WE ADVERTISE

QUARRY EQUIPMENT

Cedarapids 4A 2040 primary
Cedarapids BBB 1636 scalper
Cedarapids 4033 Hammermill secondary unit
Telsmith 3536 Primary Crushing Plant
Cedarapids #3 Kubit Breaker. Rebuilt.
Cedarapids 1036 plain bearing jaw
Farrell 8½, 13 x 24 Blake type jaw
Telsmith 40B secondary gyratory
Kennedy 37½ Gearless Gyratory. New Condition
Cedarapids 3033 Hammermill. Rebuilt.
Cedarapids 3033 Hammermill. New Condition.
3—156KVA, 240-480 V. generator sets, Murphy power
Cedarapids 16' open inclined bucket elevator
Telsmith Pulsator, 4' x 12', 3-deck screen
Telsmith Vibro-King, 4' x 12', 3-deck screen
Cedarapids 5' x 12', 2-deck-Riprap screen
Cedarapids 4' x 12', 2-deck Screen.
Cedarapids 40" x 12'4½" apron feeder.
Cedarapids 42" x 10' Apron Feeder.
3—Syntron F-44 Vibratory Feeders
Eagle 30" x 25' Washer Classifier—Dehydrator
Cedarapids 30-S, 3-comp. charging hopper.
Smithco 10-Yd. Portable Charging Bin
6' x 12', 8' x 18', 12' x 23' bins in stock
18", 24", 30", 36" conveyors & belting

SHOVELS AND CRANES

Lorain L-28, ¾-yd. Diesel Backhoe
Lorain TL-20, ½-yd. Gas Shovel or Hoe
Lorain MC-414, 20-ton Moto-Crane
Lorain MC-204, 15-ton Moto-Crane.
Lorain SP-110, 10-ton Self-Propelled Crane
Lorain TL-30-MC, Moto-Crane

TRUCKS, TRACTORS, SCRAPERS

Euclid 40FD, 15-ton Rear Dump.
Euclid 13-yd. Bottom Dumps. Good (2)
Euclid C-8 With Straight Cable Blade
Euclid TC-12 Twin Engine Tractor
Caterpillar D-7 with Hydraulic Angledozer
Caterpillar D-4 Tractor Only
Euclid 7-yd. Overhung Engine Scrapers. (2)

AIR TRAC & WELL DRILLS

Gardner-Denver DH123J Air Trac Drill. Rebuilt
Gardner-Denver ATD-3000 Air Trac with PR133J Drill. New Cond.
Bucyrus-Erie 22W Well Drill, Trk Mtd.

AIR COMPRESSORS—PORTABLE

Gardner-Denver 600' Rotary Diesel
Gardner-Denver 365' Rotary Diesel
Chicago Pneumatic 315' Air-Cooled Diesel. Recond.
2—Gardner-Denver 125' Rotary Gas
Ingersoll Rand 105' Air-Cooled Gas
LeRoi 105' Tractair with Dozer, Backhoe, Shovel

L. B. SMITH, INC.
Camp Hill, Pa.
Phone Harrisburg REgent 7-3431

FOR SALE

CRUSHER	Pa. CF3-38 Reversible Impactor
CRUSHER	Telsmith 36" Std Gyrasphere
SCREEN	Telsmith 3' x 10' Triple Deck
BUCKET	Hoiss ABIXE 2-Yd Clam Shell
FEEDER	Merrick 24" WL Feedoweight (New—Never used)
DRIVE	Link-Belt ED-91A Electrofluid 30 HP 440/3/60—1660 RPM Output

G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

NEW RAILS AND USED ONES
ALL SECTIONS
ALL ACCESSORIES
M. K. FRANK
Grand Central Palace, New York, N.Y.
401 Park Bldg., Pittsburgh, Pa.

CONCRETE PLANTS

Johnson 150 ton 3 compt. aggr. cement 1500 Noble CA-104-100 4 compt. 900 CF cement silo
Johnson TT 400-300 yd bin 4 aggr. 1 cement. Koehring mixer. 3 yd batcher.
Erie Strayer 120 tons aggr. bin, 380 bbls. cement
Noble CA-254 4 compt. large capacity. Complete
Smith 84-S 3 yd. Tilt-Mixer. 40 HP AC motor.
Johnson 300, TT1-56, 300 yds; 3 compt. aggr. 500 bbls.

FULLER KINYON CEMENT EQUIPMENT

1—7" conveying system pump Type HI3-7 Elec. motor.
1—Type C200 single stage rotary compressor 125 HP. Elec.
1—6" motor operated 2—way directing valve
1—8" Fuller Huron airslide convey. system. Complete.

MILLS—CRUSHERS—KILNS—DRYERS

JAW: Reliance, 14x24, Buchanan 18x36, 73x42, Type C 30x42, Cedar Rapids 2036, Traylor 22x36, 30x42, 56x72, Lippman 24x36; Universal 30x42; Superior McCully 42x40.
GYRATORY: Al. Chal. 8, 5K, 16", 16, Gates 12K; Traylor TZ Kennedy Van Saun 37½.
CONE: Symons 3', 4¼', 5½', Kue-Ken 36"; Traylor TY4; Telsmith 3'.
ROLL: Cedar Rapids 24x10, 55x30; Al. Chal. 37x16, 42x16. Pioneer 40x22, 40x24 triple, 54x24; Telsmith 40x22; Universal 30x18; Lippman 40x20.
MILLS—ROD—Denver 4x8, 4x10, Hardinge 4x10; Marcy 3x8, 5x12.
TUBE: Al. Chal. 6x22, Smidth 5½x20, 6'6"x21; Hardinge 4½x16" 8x18"; 8x9'; 8x36; 8x48; 10x48.
HAMMERMILLS: Penn 8XT-350 HP motor. 6XR 10'x4'x7"; Stedman 24x30, 26x42; Cedar Rapids 50-30, 2633, 36x33, 30x42 double; Dixie 36x30.
AUTOCLAVES: J&C 6'6"x38" 8' dia. x 123'
KILNS: 6'x30', 6'x120', 9'x100', 8x124'
BALL MILLS: 4½x16', 8'x36', 8'x48'

CRUSHING PLANTS

Pioneer Port. 2430 jaw 4022 twin roll 36"x20' apron feeder. Murphy Diesel.
Universal 4024 roll port. Diesel. New 1958.
C-R 2236 jaw. Port. double deck grizzly. Diesel heavy duty feeder.
Diamond Port. 2030 jaw. Heavy tandem.
Asa. West. 25x40 Prim. Crusher, 100 HP Elec. motor. Complete.
C-R 3A-GR Port. 22x36 jaw Diesel.
C-R 36" x 45" double Impeller Breaker, feeder.
Universal 3042 jaw. 4024 roll Diesel Port.

DREDGES

Pekor 6"x8" port. hull 8'x24'x3' Diesel.
Morris 6" diesel on 14'x36' hull
Markham 12"x10" cutterhead Cat. 237 main power
Markham 12"x10" cutterhead Cummins 600 Diesel
Amsco 14" suction 12" discharge heavy duty Type 397 Turbo charged Cat. engine.

RICHARD P. WALSH CO.
30 Church St. New York 7, N. Y.
CO 7-0723 Cable: RICHWALSH

PUMP: 10" acid resistant bronze, 2300 GPM @ 475 ft. TDH, 1770 RPM, Stainless Steel shaft. NEW, unused.

LOCOMOTIVES, DIESEL ELECTRIC: One 20 ton, 36" gauge; one 25 ton, standard gauge; one 25 ton, 42" gauge.

COMPRESSOR: Joy WN-114, capacity 1500 CFM, 125 lbs., 14½ x 9 x 7, 250 H.P., 2200 volt synchronous motor.

CLASSIFIERS: Akins and Wemco 60" x 27'9" and 78" x 26'9" with motors and drive. One 78" x 36'5".

LOG WASHER: 8' x 25' with new paddles, 50 H.P. motor. Excellent condition.

CRUSHERS, JAW: Allis Chalmers 40 x 42" with 150 H.P. V-belt drive motor and controls, with or without heavy duty Apron Feeder 42" x 14'3" with motor, reducer and drive, condition guaranteed. Traylor 15 x 24". Allis Chalmers 18 x 30". Other crushers 8" x 10" to 48" x 60".

CRUSHER, REDUCTION: Symons 2 ft. cone, fine bowl, 40 H.P. motor.

CLAM SHELL BUCKET: Williams 1¼ yd.

MINE HOIST: One 10' x 10', double clutched drums, 1250 H.P., 1½" rope, 38,000 lbs. line pull.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL
Lansdowne Theatre Building
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300—3-8301

FOR SALE
COMPLETE CRUSHING PLANT CONSISTING OF:

1—CEDARAPIDS 40" x 14'3" Heavy Duty Cast Steel Flight Feeder with Hopper, Wings and Drives—s/n 22199
1—CEDARAPIDS Model 43505 Double Impeller Breaker with Drives s/n 22199
2—CEDARAPIDS Model 4033 Hammermills with Drives s/n 22200 and 22201
2—CEDARAPIDS 60" x 16'0" Triple Deck Horizontal Screens with Drives s/n 22202 and 22203
1—13'10" x 25'6" Six Compartment Bin with Super Structures for Screens
1—36" x 135' Lattice Frame Conveyor with 50 HP Drive, Belt and Support Legs—Breaker to Screens
1—30" x 70' Lattice Frame Conveyor with 10 HP Drive, Belt and Support Legs—To Close Circuit From Hammermills to Feed Conveyor
1—15 HP 1800 RPM Electric Motor and Starter for Feeder
2—150 HP 1200 RPM Electric Motors and Reduced Voltage Starters—for Impact Breaker
2—250 HP 1200 RPM Electric Motors and Reduced Voltage Starters—for Two Hammermills
2—25 HP 1200 RPM High Starting Torque Electric Motors and Starters—for Two Screens
1—50 HP 1800 RPM Electric Motor and Reduced Voltage Starter—for 36" Conveyor
1—10 HP 1800 RPM Electric Motor and Starter—for 30" Conveyor
Plant Available for Immediate Dismantling and Shipping.
IN USE LESS THAN ONE YEAR.

EUCLID-TENNESSEE, INC.
P. O. Box 1176 PHONE ALpine 6-1648
Nashville, Tennessee

FOR SALE

1960 Model of Northwest Model 6 Shovel, with Murphy Diesel and 1½ yard AMSCO dipper. The serial No. is 20985. Price—$32,000.00 f.o.b. Montour, Iowa. This machine has less than 1600 hours and is in A-1 condition.

Spreitzer, Inc.
U. S. Highway #30 West,
Cedar Rapids, Iowa
Phone 365-9155
Can be bank financed

FOR SALE or RENT

50 Ton Amer. #3046 Stiffleg Derrick, 130' boom, 45' mast.
30 Ton Wiley Stiffleg Derrick. 60' bm.
20 Ton Amer. Stiffleg Derrick. 96' bm.
90 HP Lidgerwood 2D. Diesel Hoist.
200 HP Amer. #180 3D Elec. Hoist
40 Ton Amer. #408 Diesel Loco. Crane
45 Ton Gen. Elec. Diesel Elec. Loco.
80 Ton Gen. Elec. Diesel Elec. Loco.
1500 HP Alco Diesel Elec. Locomotives
1 yd. Lorain L50 Diesel Crane. 60' BM.
1600 CFM. Chic. Pneu. YCE Air Compressor

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg. St. Louis 1, Mo.

BELT SPECIAL

18" .....$2.89 (600 ft. roll)

4 ply 28 oz. ⅛" x ⅓"; 2500-3000# cover tensile, brand new. Also, all sizes 14" to 30" from stock in 4 and 5 ply.

PALTECH CO.
New Canaan, Conn. WO 6-4126

ROCK BITS
TUNGSTEN CARBIDE

All sizes, "E", "H", "D", "200", "400", "800" thread. Also 1 R-1 2 and 3 Carset Bits. LESS THAN DISTRIBUTORS' PRICES. Write for list.

SACRIFICE PRICES
JULIUS M. FOGELMAN
1640 Perkiomen Ave., Reading, Penna.

CEMENT EQUIPMENT AT ECONOMICAL PRICES

2—7'x22' Mills (2 compartment)
2—7'x22' Mills (Single Compartment)
3 Raymond 14' Dbl. Whizzer Separators
2 A-C 10'6"x8' Ball Mills
2 Hardinge 8'x36" Conical Ball Mills
Birdsboro-Buchanan Type C Jaw Crusher
Dixie 36 x 50 Hammer Mill with Feed
1 A-C 5'x10' "Ripl-Flo" Vib. Screen, 2 Decks

Send for Details & Prices

FIRST MACHINERY CORP.
209-289 TENTH STREET
BROOKLYN 15, N. Y.

Good Used Conveyor Belting
All Sizes, All plys
For Best Prices Call or Write OL. 2-4596
E. L. ASHMUS BELTING CO.
6038 49th Ave., Kenosha, Wisconsin

ELEC. AIR COMPRESSORS
695' Chgs. Pneu YCB-100 HP 220/440 V.
6—Ingor Rand, 1350, 2200, 3000 7260'
DIESEL LOCOMOTIVES, CRANES & CARS
3—5 to 7 HP Elec Car Pullers
18—115, 100, 80, 70, 65, 45, 25, 20, 10 & 8 ton GE & GM & Plymouth Diesel Locomotives
500—50 & 70 ton Gondola & Box Cars
500—50 & 70 ton Ore Cars
25 ton Amer. Diesel Loco Crane
40 ton Amer. 60' Boom Diesel Loco. Crane
40—20 & 30 yd Air Dump Cars
ROTARY DRYERS & KILNS
5' x 30', 6' x 48', 6' x 72', 8' x 60', 9' x 160', 10' x 78', 7' x 110' Rotary Kilns & Dryers
REDUCTION MILLS & FEEDERS, CRUSHERS
36" x 10' Telsmith Apron Feeder
18V-Pioneer Portable Diesel Crusher
42" x 40" Farrell Bacon Jaw Crusher
15 x 24 Cedar Rapids Port. Crusher
3' x 12', 4 x 8, 4 x 12 & 6 x 16 Vib. Screens
2', 3', 4', 5½' & 7' Symons Cones
5' x 5' & AC Ball Mill w/motor
5' x 10', 6' x 12' & 7' x 15' Rod Mills
2—KVS 5' x 8' Ball Tube Mills Air Swept
636 Allis Ch. Hydrocone Crusher
24" S Telsmith Gyrosphere Crusher 1947
4' Symons Std. Coarse Bowl 1952
10" x 30", 18" x 36", 13" x 24" Jaw Crushers.
12" Traylor Gyratory Crusher
48", 20" Traylor Primary Gyratory Crushers
2A Cedar Rapids Port. 24 x 16 Roll Crusher
14x28 & 9"x24" Cedar Rapids Jaw
18x36, 30x42, 48x60, & 66x84 Jaw Crushers
10" x 6" Sturtevant Double Roll Crusher
24" x 14" Allis Chalmers Style B Double Roll
Bradley Hercules Mills (3) Type 6000
3' x 5' Tyler Hummer Vibrating Screen
6—30" x 32" Ding's Magnetic Head Pulleys
ELEC. WHIRLEY CRANES
2 Amer. R20-60 Ganty 139' Boom

WANT KILNS—DRYERS—CRUSHERS
R. C. STANHOPE, INC.
60 E. 42nd St., N.Y. 17, N.Y.
TEL. MU 2-3076 & 2-1698

CEDARAPIDS 3042 DOUBLE IMPACTOR Portable Plant w/15' feeder, Murphy diesel, conveyor, tandem rubber, very good. $21,500
UNIVERSAL 3042 JAW CRUSHER Primary Plant including 4x18 apron feeder, 5x10 Pioneer Mesabi grizzly, 36"x90' conveyor, all electric powered. $17,500
DIAMOND 3430 JAW PORTABLE Plant w/ apron feeder, GM diesel, conveyor, tandem rubber, good. $17,000
PIONEER 2436 JAW PORTABLE Plant w/12' apron feeder, power, conveyor, tandem rubber, good. $16,500
CEDARAPIDS 4833 HAMMERMILL Plant w/4x 12 screen, rotovator, two delivery conveyors, tandem rubber, 200 hp. Cummins diesel. Good. $17,500
UNIVERSAL 2830 PORTABLE Plant w/1824 Jaw, 2x8 apron feeder, grizzly, 16x24 & 14x24 Twin Dual Roll Crushers, 3x10 2½-deck screen, rotovator, two delivery conveyors, Cat. diesel, tandem rubber, late mdl, rebuilt. Suitable gravel or limestone operation. $22,500
ROGERS 3018 Double Roll portable Plant w/4x13 screen, charging & discharge conveyors, 671 GM diesel, single pass, pneumatic tires. Good. $8500
SAUERMAN 2½ cy. DRAGSCRAPER, 2-drum roller brg. hoist, 125 hp. motor, bucket, blocks, mast, good. $8500
JAW CRUSHERS, Wisc. Foundry 15x28 roller brg. good. $3500 Universal 11x18, new brgs, $750 Universal 9x16, good. $550
ROLL CRUSHERS, Pioneer 54x24 Double Roll, excellent. $6500 Pioneer 30x18 double, fair. $1000 Cedarapids 16x16, new brgs. $850
VIBRATING SCREENS, Simplicity 4x10 2-deck, excel. $1000 4x12 2-deck, excel. $1750 4x16 single, excel. $750 4x14 single, excel. $1250 3x10 2-deck, good. $850 Cedarapids 4x12 2-deck flat, rebuilt. $1750 3x8 2-deck flat, excel. $1000 3x10 2-deck inclined, reconditioned. $850 4x8 3-deck inclined, reconditioned. $1000 Seco 5x8 3-deck, good. $1250 Universal 4x12 2-deck, reconditioned $1250 3x8 2-deck. $350 Pioneer 4x12 2½-deck, rebuilt. $2250
SCREW WASHERS Eagle 30"x18' single coarse, like new. $3150 15"x12' single like new, w/ motor. $850 22"x15', single, coarse, good. $1350
AIR TRACK DRILLS, Chicago Pneumatic G800, excellent. $3750 Ingersoll Rand CM2-D40 CRAWL-IR, jumbo drill mounting, used 1 yr, cost $15,000 Sell $9000 Rental purchase.
COMPRESSORS Ingersoll Rand 600 cfm Rotary diesel portable, good. $5500 Joy 500 cfm portable diesel, rebuilt. $3250 Ingersoll 500 cfm portable diesel, overhauled. $1850 Jaeger 315 cfm portable diesel, rebuilt. $2750 Davey 210 cfm portable diesel, rebuilt. $2000 Rental Purchase.
PORTABLE SURGE BINS, Cedarapids 10 cy. excel. $2750 6 cy. excellent. $2350
SHOVEL FRONTS P&H 655B, new, complete w/deck mchy. $3850 P&H 255A, like new. $750 Lima 34, new. $950

WENZEL MACHY. CO.
585 S. 10th Kansas City, Kans. Mayfair 11710

DEPENDABLE USED MACHINES
Minneapolis-Moline Tractor Model R Front End Loader & Backhoe

Gardner Denver 105 Air Compressor	Bay City 25 ½ yd. Hoe	Hopto Model 120TM54
Unit 1020 Magnet Crane	Adams Tandem Grader	Quickway Truck Crane
Insley ½ Yd. Magnet Truck Crane	Austin 8 ton Roller	Lorain 41 Dragline
Double Deck Screens	P&H 150 ½ yd. Dragline	Athey Loader
Unit ½ Yd. Backhoe Model 514	Vermeer 524T Ditcher	American 50B Hoist

This equipment rebuilt in our modern plant by expert mechanics. Come See It!
Chicago phone HI-lltop 5-6800 **TRACTOR & EQUIPMENT CO.** 10002 SW Hwy, Oak Lawn, Ill.

EUCLIDS FOR SALE
22-TON REAR DUMPS

EXCELLENT OPERATING CONDITION

FIVE—46TD's
FIVE—38TD's
FIVE—51TD's

EUCLID DIV. G. M. C. - IRON RANGE BRANCH
HIBBING, MINNESOTA
Phone: AM 3-7507

PLANTS: 2x5000 KVA Gydro Elec. Power. Sulphuric Acid Contact. Univ 293G, 600, 880, Twin Dual Master, CR2036, Commander, Pioneer 24V Crushing Port. AW2540, Pioneer 3240 staty. Noble CA506 Batch. 100 ton Semi-Port. Asphalt.
CRUSHERS: 9x8, 1616, 1036, 1536, 2036, 2236, 2436, 2540, 3042, 3240, 3648, 4248, 4860, 6084
JAW: Allis 6K, 823, 10", Telsmith 13A, 40B, 16", 20", 48", 489, KVS 19, 25½, 37½. Traylor 2'4", 3', 4' GYR. 3' std and s/h, 4', 5½', 7' Symons **CONES.**
DRYERS: 3x12, 4x16, 4x40, 5x30, 5½x60, 8x70 24x50, 24x126, 30x11, 42x160 **CONVEYORS.** Two 24"x30' McLanahan dbl Log **WASHERS** 6" to 16" **DREDGES, PUMPS,** all sizes.
54" x 70" Bird **CENTRIFUGE**
¾ yd. Lorain L50 **SHOVEL FRONT**
MILLS: 3640, 5060 Dixie, CR2033, 3033, Williams #30, Univ 3645, Penna CF3038 Hammer. Bradley Jr & Sr. 4x11 Rod, 8'x36", 5x17, 5x21, 7x50 Ball.
SHOVELS: NW25, 6, 80D, Lorain L50, 75, 820, Lima 1201. Link Belt L851, 85, 96, 98, P&H 255A, 455C. Bucyrus 48B, 54B, 150B. Marion 7200. Manitowoc 2000B, 3500, 4500.

MID-CONTINENT EQUIPMENT CO. INC.
8321 Gannon St. Louis 32, Mo. Wydewn 1-2826

36" x 48" Traylor Bull Dog Jaw Crusher
28" x 36" Traylor Bull Dog Jaw Crusher
30" x 36" Traylor Type H Jaw Crusher
18" x 36" Farrell Jaw Crusher
7" x 10" Kue-Ken Jaw Crusher
10-30 & 10-40 Good Road Jaw Crusher
20" x 36" Universal Jaw Crusher
36" Symons Short Head Crusher
24" Telsmith Crusher
32" & 40" Telsmith Gyratory Crusher
16" Telsmith Gyratory Crusher
22" x 40" Cedar Rapids Rolls
36" x 15' Stephens Adamson Feeder
30" Feeder
18" x 24" Cedar Rapids Portable

J. S. NEWSWANGER, Blue Ball, Pa.

WHEN YOU GIVE

RETARDED CHILDREN CAN BE HELPED

Support Your Local Association for Retarded Children

Sink Float Plant-Gravel Wash-Screen Pl. 12" Spiral Pipe-Eagle Port Sand Washer. Jigs 2—10'x78' Dryers—2'3'4'5½'7' Symons and Telsmith Cone Crushers—3648-4042-4872 Jaw Crushers and smaller sizes—48" & 20" Gyratory Vibrating Feeders—other types of Feeders—Eagle Fine & Coarse Material Washers—Dixie Non Clog moving plate Hammermills—Asphalt Plants—Jaw—Cone—Gyratory—Roll Double and Triple—Hammermill and Impact Crushers—Ball—Rod—Tube Mills—Screening, Washing and Crushing Plants, Classifiers Compressors, Conveyors, Cranes, Drills, Dump Cars, Dredges, Feeders, Hoists, Motors, Generators, Kilns, Dryers, Locomotives, Pumps, Screens, Shovels, Draglines, Transformers, Euclid Trucks.

STANLEY B. TROYER EQUIPMENT CO.
Phone 546-6427 546-5954 Box 97, Crosby, Minn.

1—60" AJO Traylor Rod Crusher
1—Birdboro Buchanan, Typ. C, Jaw 30"x 42", 100 HP
1—7' x 120' Rotary Kiln, ½"
1—3' x 8' Allis-Chalmers Rod Mill
1—8' x 80' Traylor Rotary Dryer ⅜" shell
2—8' x 40' Link-Belt Dryers
1—5' x 60' Rotary Kiln
1—Penn. Hammermill SXT-14, 6' x 2'
1—Hardinge 8' x 22" Conical Ball Mill
1—36 x 20 Dixie Non-Clog Hammermill
1—#5 Austin Gyratory Crusher
6—Vibratory Screens, 5'x12', 4'x10', 4'x8'
1—Oliver Horizontal Filter 6'
2—GE Diesel Electric Locomotives 60 Ton, 425 HP

SEND US YOUR SURPLUS LIST
SEND US YOUR INQUIRIES

N. J. SNOW EQUIPMENT CO.
1700 Holcombe Houston 25, Texas JA 2-0359
507 Fifth Ave. New York 17, N. Y. OX 7-5895

FOR SALE
¾ yd Lima Dragline 1948, completely rebuilt, 50' boom, Buda gas engine $5,900.00
Scrubber, Universal 5' x 8' complete with drive & motor, used 2 seasons $1,950.00
Berkley Pump & motor, 5" intake, used 2 seasons, perfect $495.00
45' Brand New never been used Winslow Truck Scale, complete $4,200.00

Ringwood Washed Sand & Gravel Co., Inc.
Greenwood Lake Turnpike Hewitt, New Jersey

MOTORS AND GENERATORS
All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Shaft mounted Speed Reducers, Falk couplings and V-belt drives.
EXPERT REPAIR SERVICE
NUSSBAUM ELECTRIC COMPANY
220 E. Douglas Ave. Fort Wayne, Ind.

CONSULTING ENGINEERS AND SERVICES

Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs

E. LEE HEIDENREICH JR.
CONSULTING ENGINEERS
75 Second Street
Newburgh, N.Y.
Phone JO 1-1828 (Code 914)

Operation
Plant Layout
Design
Appraisals
Construction

J. H. ROBINSON AND ASSOCIATES LTD.
CONSULTING ENGINEERS
SPECIALISTS IN LIME & GYPSUM DESIGN AND OPERATING PROBLEMS
555 Merton St., Toronto 7, Ontario

JOHN R. RAND INCORPORATED
Geologic Consulting
Mineral exploration—geophysical surveys—reserves evaluation—groundwater studies—soils—engineering geology—earth materials—aggregates.
67 State Street — Augusta, Maine

R. L. LOOFBOUROW
Consulting Mining Engineer
Site Tests, Plans, Estimates & Supervision for Underground Construction, Mining and Control of Rock and Water
4032 QUEEN AVE. SO., MINNEAPOLIS, MINN.

Core Drilling
Minerals Clays Limestone
Foundation Testing
Buildings Highways
THOMASVILLE DRILLING & TESTING CO., INC.
Thomasville, Pennsylvania

JAMES R. DUNN AND ASSOCIATES
GEOLOGIC CONSULTANTS
ECONOMIC EXPLORATION AND EXPLOITATION OF EARTH MATERIALS THROUGH GEOLOGY
Metals—Non-metals—Aggregates
P.O. Box 187 — Averill Park, N. Y.

KEEP ABREAST
WITH
INDUSTRY TRENDS
THROUGH
ROCK PRODUCTS

EQUIPMENT WANTED

WANTED
BRIDGE CRANE
50' Span—100' to 200' long—
30' Clearance under Clam Shell
8 Ton Lift
G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

WANT TO BUY
Car Pullers, Conveyors & Feeders
Rotary Kilns, Dryers & Coolers
Ball, Rod & Tube Mills
Roll, Cone, Jaw & Gyratory Crushers
Compressors, Locomotives, Derricks & Cranes
Screens, Separators, Classifiers, Cars
THE DARIEN CORP.
60 E. 42nd St., N.Y. 17, N.Y. Tel. MU 2-1898

WANTED TO BUY
Rotary Kilns, Dryers, and complete cement plants
R. Gelb & Sons, Inc.
U. S. Highway 22, Union, N. J.
Murdock 6-4900

WANTED
Screen for Washing Plant 4' x 12' or 4' x 14', two or three deck.
EMIL OLSON & SONS
P.O. Box 106
Albert Lea, Minnesota

WANTED TO BUY
27T or 29T Bucyrus-Erie Drills Write Box T-91, c/o Rock Products, 79 W. Monroe St., Chicago 3, Ill.

Markets are not merely people, but people who *buy*.
Advertise your used equipment in ROCK PRODUCTS

INDEX TO WHERE TO BUY

Business Opportunities 152
Consulting Engineers and Services 152
Equipment & Supplies For Sale 148-151
Equipment Wanted 152

Ashmus, E. L. Belting Co. 151

Bacon-Pietsch Co., Inc. 149
Bonded Scale and Machine Co. 149
Brill Equipment Company 148

Corson, G. & W. H., Inc. 150, 152

Darien Corporation 152
Dunn, James R., and Associates 152

Euclid Div., GMC, Iron Range Branch ...151
Euclid Div., GMC, Minnesota Branch 149
Euclid-Tennessee, Inc. 150

First Machinery Corp. 151
Fogelman, Julius M. 150
Frank, M. K. 150

Gelb, R., & Sons, Inc. 152
Gull Contracting Co., Inc. & L. G. DeFelice & Son 149

Heat & Power Co., Inc. 148
Heidenreich, E. Lee, Jr. 152

Loofbourow, R. L. 152
Lubrecht, William III 149

McDonald, Louis G. 152
Mid-Continent Equipment Co., Inc. 151

Newswanger, J. S. 151
Nussbaum Electric Co. 151

Olson, Emil, & Sons 152
O'Neill, A. J. 150

Paltech Co. 150
Perry Equipment Corp. 149

Rand, John R., Inc. 152
Ringwood Washed Sand & Gravel Co. 151
Robinson, J. H. & Associates Ltd. 152

Smith, L. B., Inc. 150
Snow, N. J., Equipment Co. 151
Spreitzer, Inc. 150
Stanhope, R. C., Inc. 151
Swabb, Frank, Equipment Co., Inc. 149

Thomasville Drilling & Testing Co., Inc. ..152
Tractor & Equipment Co. 151
Troyer, Stanley B., Equipment Co. 151

Unversagt, G. A. & Sons, Inc. 148

Walsh, Richard P. Co. 150
Wensel Machy. Co. 151
Whisler Equipment Co. 150

Zidell Explorations, Inc. 149

BUSINESS OPPORTUNITIES

FOR SALE OR LEASE

Stockpile of over 2 million tons of manufactured sand located at Joplin, Mo. This material is being used for roofing granules, epoxy resin aggregate, streets and highways, concrete block and pipe producers.

Will sell outright or will lease on tonnage basis.

Contact LOUIS G. McDONALD, Owner.

Rt. 4 Box 62 Joplin, Mo. Phone MA 40244

INDEX TO DISPLAY ADVERTISERS

Allis-Chalmers 16, 17
Allison Division
General Motors 54, 55, 141
American Clay Machinery Div.
Huber-Warco Company 133
American Manganese Steel Div.
American Brake Shoe Co. 106
Armco Drainage & Metal
Products 119
Armco Steel Corporation
Sheffield Division 115
Union Wire Rope 74, 75

Babcock & Wilcox Co. 31
Bailey Meter Co. 14
Barber Greene Co. 8, 9
Smith Engineering Works Div. 73
Bath Iron Works Corp.
Pennsylvania Crusher Div. 53
Bemis Brothers Bag Co. 145

Canadian Refractories Ltd. 25
Caterpillar Tractor Co. 26, 27
Chicago Pneumatic Tool Co. 60
Chrysler Corp.
Dodge Truck Div. 22, 23
Clark Equipment Company
Construction Machinery Div. 62, 63
Coates Steel Products Co. 77
Colorado Fuel & Iron Corp.
Roebling's John A. Sons Div. ..143
Columbia Steel Casting Co., Inc. .118
Combustion Engineering, Inc.
Raymond Div. 125
Conveyor Systems, Inc. 130

Detroit Diesel Engine Div.
General Motors Corp. 131
Dings Magnetic Separator Co. ..118
Dodge Mfg. Corp. 135
Dodge Truck Div.
Chrysler Corp. 22, 23
Drott Mfg. Corp. 39
DuPont, E. I., de Nemours & Co.,
Inc. 71

Eagle Iron Works 48, 49
Eaton Mfg. Co.
Fuller Transmission Div. 68
Ehrsam, J. B. & Sons Mfg. Co. ..132
Eriez Manufacturing Co. 67

Falk Corp. .....Inside Back Cover
Federal-Mogul Service Div.
Federal-Mogul-Bower Bearings,
Inc. 45
Firstone Tire & Rubber Co. 120
Frog, Switch & Mfg. Co. 122

Fuller Co.
Subsidiary of General American
Transportation Corp. 34
Traylor Engineering & Mfg.
Div. 7
Fuller Transmission Div.
Eaton Mfg. Co. 68

Gardner-Denver Co. 78, 79
General American Transportation
Corp.
Fuller Co., Subsidiary 34
General Electric 20, 21
General Motors Corp.
Allison Division 54, 55, 141
Detroit Diesel Engine Div. 131
General Refractories Co. 46
Goodrich, B. F., Co. 1
Goodyear Tire & Rubber Co. 13
Gruendler Crusher & Pulverizer
Co. 124

Hardinge Co., Inc. 56
Harnischfeger Corp.
P&H Construction & Mining
Div. 3
Hewitt-Robins 138
Hough, Frank G., Co. 32, 33
Huber-Warco Co.
American Clay Machinery Div. 133

International Harvester Co. 39, 41
Iowa Mfg. Co. 42, 43, 51

James, D. O., Gear Mfg. Co. 127
Jeffrey Mfg. Co. 117
Joy Manufacturing Co.
Western Precipitation
Div. .....Inside Front Cover, 136

Kaiser Aluminum & Chemical
Sales, Inc. .....Back Cover
Kaiser Engineers
Div. Henry J. Kaiser Co. 28
Kennedy Van Saun Mfg. & Eng.
Corp. 109
Kolman Mfg. Co. 146

LeRoi Div.
Westinghouse Air Brake Co. ..69
Link-Belt Co. 61

McLanahan Corp. 15
Macdonald Engineering Co. 6
Mack Trucks, Inc. 36, 37

Marion Power Shovel Co. Div.
Universal Marion Corp. 112
Mine & Smelter Supply Co. 64, 65
Mission-Manufacturing Co. 57
Murphy Diesel Co. 123

National Crushed Stone Assoc. ..144
National Sand & Gravel Assn. ...137
Nicholson, James A., Book ...122, 136
Nordberg Mfg. Co. 19
Northwest Engineering Co. 5

Owens-Corning Fiberglas Corp. ..105

P & H Construction & Mining Div.
Harnischfeger Corp. 3
Pekor Iron Works, Inc. 124
Pennsylvania Crusher Div.
Bath Iron Works Corp. 53

Raymond Div.
Combustion Engineering, Inc. ..125
Roebling's, John A., Sons Div.
Colorado Fuel & Iron Corp. ...143

Sauerman Bros., Inc. 70
Scandura Inc. 35
Screen Equipment Co., Inc. 129
Smidth, F. L., & Co. 10
Smith Engineering Works Div.
Barber-Greene Co. 73
Standard Metal Mfg. Co. 72
Synchro-Start Products, Inc. 134

Texaco Inc. 58, 59
Traylor Engineering & Mfg. Div.
Fuller Co. 7
Twin City Iron & Wire Co. 134
Tyler, W. S., Co. 4

Union Wire Rope
Armco Steel Corp. 74, 75
Universal Marion Corp.
Marion Power Shovel Co., Div. 112

Western Precipitation
Div. Joy Mfg.,
Co. .....Inside Front Cover, 136
Westinghouse Air Brake Co.
LeRoi Division 69
Wilfley, A. R., & Sons, Inc. 134
Williams Patent Crusher &
Pulverizer Co. 66

ROCK PRODUCTS INDEX

January-December 1961, Volume 64

A

Aggregates—(also see crushed stone, sand and gravel and slag)
—Aggregate plant readies magnesium ore, April 89
—Aggregate power records sent tumbling at Grand Coulee Dam, Part 3, October 94
—Aggregates processing tips, Part 2, October 91
—Beneficiation pays off, Part 3, November 104
—HMS meets space-age challenge, September 82
—Look to metallurgy for processing tips, Part 1, August 86
—Mountains of placer debris promises cheap and easy gravel, January 106
—West Virginia sizes up the aggregates situation, August 96
Aggregates processing tips, Part 2, October 91
Aggregates production at dams, Part 1, July 88
—Part 2, August 102
—Part 3, October 94
—Part 4, November 86
—Part 5, December 108
Agricultural limestone
—Education sells ag-lime, April 126
—Publicity sells ag-lime, February 110
Alabama Metallurgical Corp., Selma, Ala., April 84
Alamet distills limestone to yield magnesium, April 84
Alfred, Robert C.
—Granite tests new drill rig, March 81
All-in-one washing plant hits the road, June 128
Andrews, Peter B. B.
Back in step in '61, January 96
Are industry statistics a bane or a boon? February 82
Asphalt Paving Co., Denver, Colo., March 84
Automatic controls pace gravel plant, March 84
Automation
—Automatic controls pace gravel plant, March 84
Here's how to use the X-ray spectrograph, March 90
Automation spurs sampler design, June ...109
Azbe, Victor J.
—Lime technology moves ahead, Part 1, August 110

B

Bell, Joseph N.
—Are industry statistics a bane or a boon? February 82
—The Highway Program's ready to highball, December 80
—How serious are the highway scandals? June 85
—Is the percentage depletion squabble ended? May 108
—The NCSA laboratory—service through research, October 80
—NSGA invests in progress, March 76
—Road program roulette, May 95
—Where does the interstate highway program stand today? July 76
—White cement debuts on West Coast, May 153
—Will Congress resolve money troubles on the interstate system? April 80
Bellinger, T. F.
—How conveyor safety pays rich dividends, Part 3, March 112
Belt conveyor system masters terrain, October 116
Beneficiation pays off, Part 3, November 104
Bergstrom, John H.
—All-in-one washing plant hits the road, June 128
—Automatic controls pace gravel plant, March 84
—Controls monitor gypsum kettle, November 82
—Desert unfolds its gypsum lode, February 92
—Diversification leads to extra profits, October 86
—From austerity to prosperity, May ...163
—Gravel producers do win zoning battles, February 97
—Gypsum processor rolls on rubber, March 88
—Hawaii leaps into cement production race, May 101
—HMS meets space-age challenge, September 82
—Idealite girds for new western markets, November 76
—John Day Dam breeds giant aggregate system, April 110
—Kaiser carves into a mountain of sand, August 82
—Market dictates new plant's design, May 142
—New Mexico mill taps Perlite's mother lode, November 78
—Pabco's gypsum crystals sparkle, April 90
—Pennies save dollars for Mission Rock, June 96
—Promotion solves rock dilemma, January 101
—Rocklite celebrates 20th birthday, July 94
Bernhart, D. N.
—Do you add phosphates to your slurries? October 120
Blasting
—Cast history of a blast, June 93
Brannan Sand & Gravel Co., Denver, Colo., June 128
Brooksville Rock Co., Brooksville, Fla., October 101

C

Calaveras Cement Co., San Andreas, Calif., June 102
Campbell Limestone Co., Liberty, S.C., March 81
Canadian Johns-Manville Co., Ltd., Asbestos, Que., Canada, December 96
Case history of a blast, June 93
Cement
—Cement mill profits from paper mill waste, September 136
—Do you add phosphates to your slurries? October 120
—Forecast for 1961, January 88
—How to get better additives control for finish mills, July 102
—How to lubricate cement mill bearings, February 104
—Import battles pay off, May 126
—Taiwan cement producers forge ahead, May 172
Cement mill profits from paper mill waste, September 136
Cement plants
—From austerity to prosperity, May 163
—Hawaii leaps into cement production race, May 101
—White cement debuts on West Coast, May 153
Chess, W. B.
—Do you add phosphates to your slurries? October 120
Cheveresux Sand & Gravel Co., Auburn, Calif., October 86
Coast Rock Products, Santa Maria, Calif., September 82
Construction
—Back in step in '61, January 96
—Forecast for '61, January 86
Controllers exchange know-how on financial practices, October 112
Controls monitor gypsum kettle, November 82
Conveyors
—Belt conveyor system masters terrain, October 116
—How to keep your conveyors rolling all winter, November 92
—Let's take a sharp look at belt conveyor design, September 113
Conveyors speed raw materials through new cement plant, December 84
Cooperation breeds success, December 102
Corson prescribes research for success, April 100
Crushed stone
—Forecast for '61, January 94
Crushed stone plants
—Aggregate plant readies magnesium ore, April 89
—Granite plant brackets Deep South markets, February 86
—Mechanization pays—even in South Africa, May 133
—Promotion solves rock dilemma, January 101
—Scrubbers whip limerock matrix, October 101
—Special machinery pays off for underground limestone producer, December 104
—Surge piles displace stockpiles, July .. 83
—Tough limestone yields to hammermills, September 130

D

Derrom, Donald L.
—How "equilibrium" solves kiln problems, Part 3, January 114
Desert unfolds its gypsum lode, February 92
Dispersion agents
—What do you know about dispersion agents? May 180
Diversification leads to extra profits, October 86
Dolomite unlocks magnesia from the sea, May 113
Do you add phosphates to your slurries? October 120
Drilling
—Granite tests new drill rig, March 81
—Tilt your drill—improve efficiency, January 109
Dundee Cement Co., Dundee, Mich., July .. 87
Dust control
—Rocklite celebrates 20th birthday, July 94

E

Eakin, James H.
—Education sells ag-lime, April 126
Editor's page
—1961—Year of opportunity, January .. 15
—Better safety means dollars and sense, April 14
—Fortune favors the brave, June 16
—Get busy on public relations, March .. 15
—How to cure an ulcer, August 14
—Research—best bet for future success, July 18
—Safety by legislation? October 20
—There's danger in discord, November 18
—Tug of war on depreciation? February 16
—What price efficiency? May 19
—You can save $10,000 a year, September 18
—There's a "new look" in minerals research, December 18
Education sells ag-lime, April 126
Elmhurst-Chicago Stone Co., Bartlett, Ill., December 90
Elwood, J. F.
—How to keep your conveyors rolling all winter, November 92
Erlich, J.
—Mechanization pays—even in South Africa, May 133
Evans, Coleman & Evans, Ltd., Vancouver, B. C., May 142

F

Fair, Ernest W.
—How to pick a maintenance man, October 85
Fiberboard
—Pabco Gypsum Div. of Fiberboard Paper Products Corp., South Gate, Calif., April 90

Forecast for '61, January 85
From austerity to prosperity, May 163
Federal highway program
—How serious are the highway scandals? Part 3, June 85
—Road program roulette, Part 2, May .. 95
—Where does the Interstate Highway Program stand today? Part 4, July .. 76
—Will Congress resolve money troubles on the Interstate system? April 80
Fleming, Seymour B.
—Let preventive maintenance slash your safety costs, September 91

G

Gates, R.
—Do you add phosphates to your slurries? October 120
Gieskieng, D. H.
—Statistical tools monitor kiln operation, August 91
Golson, C. E.
—Aggregates processing tips, Part 2, October 91
—Beneficiation pays off, Part 3, November 104
—Look to metallurgy for processing tips, Part 1, August 86
Granite plant brackets Deep South market, February 86
Granite tests new drill rig, March 81
Gravel producers do win zoning battles, February 97
Griesemer Stone Co., Springfield, Mo., July 96
Gypsum plants
—Controls monitor gypsum kettle, November 82
—Desert unfolds its gypsum lode, February 92
—Gypsum processor rolls on rubber, March 88
—Pabco's gypsum crystals sparkle, April 90
Gypsum processor rolls on rubber, March 88

H

Hawaii leaps into cement production race, May 101
Hawaiian Cement Corp., Barber's Point, Oahu, Hawaii, May 163
Heavy-media separation
—HMS meets space-age challenge, September 82
Here's how to slim your hard-facing budget, Part 1, September 104
Here's how to use the X-ray spectrograph, March 90
Highway program
—The Highway Program's ready to highball, December 80
Holloway, Inc., H. M., Wasco, Calif., March 88
HMS meets space-age challenge, September 82
Hope for 1961: Growing markets, no inflation, January 85
How conveyor safety pays rich dividends, Part 2, March 112
How "equilibrium" solves kiln problems, Part 2, January 114
How serious are the highway scandals? Part 3, June 85
How to get better additives control for finish mills, July 102
How to keep your conveyors rolling all winter, November 92
How to lubricate cement mill bearings, February 104
How to pick a maintenance man, October 85
Huge crane delivers the goods, July 87

IJ

Idealite Co., Rocky Flats, Colo., November 76
Idealite girds for new western markets, November 76
Import battles pay off, May 126
Industrial silica
—Diversification leads to extra profits, October 86
Industry reports
—Are industry statistics a bane or a boon, February 83
Is the percentage depletion squabble ended? May 108
It's the end of an era in Chicago, December 90
John Day Dam breeds giant aggregate system, April 110
Johns-Manville, No Agua, New Mex., November 73

K

Kaiser carves into a mountain of sand, August 82
Kaiser Gypsum Co., Rosario, New Mex., new plant, February 92
Kaiser Sand & Gravel, Santa Cruz, Calif., August 82
Kennerly, A. B.
—Publicity sells ag-lime, February 110
Kent, J. A.
—West Virginia sizes up the aggregates situation, August 96
Keshen, Albert S.
—Taiwan cement producers forge ahead, May 172
Kester, Bruce E.
—Here's how to use the X-ray spectrograph, March 90
Kilns, cement
—How "equilibrium" solves kiln problems, Part 2, January 114
—Statistical tools monitor kiln operation, August 91
Klovers, E. J.
—How to lubricate cement mill bearings, February 104
Kochanowsky, Dr. Boris J.
—Tilt your drill—improve efficiency, January 109

L

Labor relations
—Secondary boycotts menace labor peace, March 96
—Union demands swell—cement producers worry, April 96
Lambeth, Harry J.
—Secondary boycotts menace labor peace, March 96
Lenhart, Walter B.
—Aggregate, power records sent tumbling at Grand Coulee Dam, Part 3, October 94
—Aggregates production at dams, Part 1, July 88
—Part 2, August 102
—Part 4, November 86
—Part 5, December 108
—Mountains of placer debris promise cheap and easy gravel, January 106
—What do you know about dispersion agents? May 180
Let preventive maintenance slash your safety costs, September 91
Let's take a sharp look at belt conveyor design, September 113
Lightweight aggregates
—Forecast for '61, January 90
—Rocklite celebrates 20th birthday, July 94
—What's the mood of the lightweight aggregates industry? November 70
Lightweight aggregate plants
—Idealite girds for new western markets, November 76
—New Mexico mill taps perlite's mother lode, November 73
Lime
—Corson prescribes research for success, April 100
—Forecast for '61, January 93
—Lime technology moves ahead, Part 1, August 110
Lime industry eyes new markets, July ...110
Lime plant saves San Diego money, August 78
Lime plants
—Alamet distills limestone to yield magnesium, April 84
—Dolomite unlocks magnesia from the sea, May 113
—Lime plant saves San Diego money, August 78
Lime technology moves ahead, Part 1, August 110
Lindsay, George C.
—Corson prescribes research for success, April 100
—You can jump profits with good maintenance, September 86
Lone Star Cement Corp., Hudson, N.Y., September 130
Look to metallurgy for processing tips, Part 1, August 86
Lubrication
—How to lubricate cement mill bearings, February 104
Ludwig, Norman C.
—How to get better additives control for finish mills, July 102

M

Magnesia
—Dolomite unlocks magnesia from the sea, May 113
Maintenance
—Here's how to slim your hardfacing budget, Part 1, September 104
—How to pick a maintenance man, October 85
—Let preventive maintenance slash your safety costs, September 91
—Semi-automatic welding improves hardfacing techniques, Part 3, November 96
—Send your service men to school, September 94
—Welding shops can help cut your hard-facing budget, Part 2, October 97
—You can jump profits with good maintenance, September 86
Management
—Is the percentage depletion squabble ended? May 108
—Union demands swell—cement producers worry, April 96
Market dictates new plant's design, May .142
Materials handling
—What do you know about bin design? February 115
Mechanization pays—even in South Africa, May 133
Meeting reports
—AIEE 3rd annual meeting, June 132
—Cooperation breeds success, NSA, December 102
—Lime industry eyes new markets, July 110
—NCSA tackles growing industry problems, September 125
—NSGA—Controllers exchange know-how on financial practices, October ..112
—NSGA "talks out" industry problems, April 131
—New hurdles confront stone producers, NCSA, March 128
—Plain talk on safety . . . or the lime industry at the crossroads, NLA, December 98
—Producers pinpoint production problems, NLI, March 104
—Safety—from A to Z, NSA, December 95
—Taxation, public relations and engineering, NSGA Board meeting, October 108
Meschter, Elwood
—Aggregate plant readies magnesium ore, April 89
—Alamet distills limestone to yield magnesium, April 84
—Conveyors speed raw materials through new cement plant, December 84
—Dolomite unlocks magnesia from the sea, May 113
—Granite plant brackets Deep South markets, February 86
—It's the end of an era in Chicago, December 90
—Let's take a sharp look at belt conveyor design, September 113
—Scrubbers whip limerock matrix, October 101
—Surge piles displace stockpiles, July .. 83
Missile City Rock Co., Lompoc, Calif., January 101
Mission Rock Co., Santa Paula, Calif., June 96
Mitchell, John A.
—Automation spurs sampler design, June 109
Montevallo Limestone Co., Montevallo, Ala., April 89
Mountains of placer debris promise cheap and easy gravel, January 106

N

National Bureau of Standards
—4th International symposium, January 99
National Crushed Stone Association
—Board of Directors meeting report, September 125
—Meeting report, March 128
—NCSA laboratory: service through research, October 80
—Tackles growing industry problems, September 125
National Lime Association
—Annual meeting, July 110
—Plain talk on safety . . . or the lime industry at the crossroads, December . 98
National Limestone Institute
—16th annual meeting, March 104
National Safety Congress
—Safety—from A to Z, December 95
National Sand & Gravel Association
—Meeting report, October 108
—NSGA invests in progress, March 76
—NSGA "talks out" industry problems, April 131

Please turn page

Annual Index, 1961 . . .

continued from page 155

National Slag Association
—43rd annua. meeting, January 122
—Cooperation breeds success, December 102
New hurdles confront stone producers, NCSA meeting report, March 128
New Mexico mill taps perlite's mother lode, November 73
New research lab probes concrete products, June 102
Newton, D. E.
—Aggregates processing tips, Part 2, October 91
—Beneficiation pays off, Part 3, November 104
—Look to metallurgy for processing tips, Part 1, August 86
Northwestern States Portland Cement Co., Mason City, Iowa, December 84

O

O'Hara, L. M.
—How to get better additives control for finish mills, July 102
Once an underground mine—now a modern warehouse, July 96

P

Pabco's gypsum crystals sparkle, April ... 90
Pennies save dollars for Mission Rock Co., June 96
Percentage depletion
—Is the percentage depletion squabble ended? May 108
Perlite
—New Mexico mill taps perlite's mother lode, November 73
Permanente Cement Co., Oahu, Hawaii, May 101
Plain talk on safety . . . or the lime industry at the crossroads, December 98
Portable plants
—All-in-one washing plant hits the road, June 128
Porter Co. Inc., H. K., Pascagoula, Miss., May 113
Portland Cement Association
—4th International symposium, January 99
Producers pinpoint production problems, NLA meeting report, March 104
Producers: watch your scale weight, June 122
Promotion solves rock dilemma, January ..101
Publicity sells ag-lime, February 110
Pumps
—Rubber-lined pumps can cut operating costs, November 101

R

Raw material shortage plagues slag industry, January 122
Research
—Corson prescribes research for success, April 100
—Japanese research in cement and concrete is practical, February 22
—NCSA Laboratory: service through research, October 80
—NSGA invests in progress, March 76
—New research lab probes concrete products, June 102
—What do you know about dispersion agents? May 180
Riverside Cement Co., Riverside, Calif., May 153
Road program roulette, May 95
Rockfite celebrates '60th birthday, July 94
Rocky's Notes
—Character of calcium hydroxide determined by hydration, June 21
—Chemical and natural control of pests, August 21
—Earliest American advocate of agricultural lime, October 24
—How much do we know about cement raw materials? December 24
—Introduction to materials science, January 19
—Japanese cement and concrete research, March 16
—Japanese research in cement and concrete is practical, February 22
—Japanese research on portland cement problems, November 22
—Mechanics of cement hydration, April . 16
—More about nonuniformity in cements, July 22
—The soil and its fertility, May 24
—Something about the chemistry of silicon, September 24
Rubber-lined pumps can cut operating costs, November 101

S

Safaris in cement, Part 3, January 114
Safety
—How conveyor safety pays rich dividends, Part 3, March 112
—Let preventive maintenance slash your safety costs, September 91
—Plain talk on safety . . . or the lime industry at the crossroads, December .. 98
—Safety—from A to Z, December 95
—Safety is the badge of a pro, December 100
Sampling
—Automation spurs sampler design, June 109
Sand and Gravel
—Forecast for '61, January 91
—Mountains of placer debris promise cheap and easy gravel, January 106
—NSGA invests in progress, March 76
Sand and gravel plants
—All-in-one washing plant hits the road, June 128
—Automatic controls pace gravel plant, March 84
—Belt conveyor system masters terrain, October 116
—Gravel producers do win zoning battles, February 97
—It's the end of an era in Chicago, December 90
—John Day Dam breeds giant aggregate system, April 111
—Kaiser carves into a mountain of sand, August 82
—Market dictates new plant's design, May 142
—Pennies save dollars for Mission Rock Co., June 96
Schoof, R. F.
—How conveyor safety pays rich dividends, Part 3, March 112
Scrubbers whip limerock matrix, October 101
Secondary boycotts menace labor peace, March 96
Seeger, R. W.
—West Virginia sizes up the aggregates situation, August 96
Semi-automatic welding improves hardfacing techniques, Part 3, November 96
Send your service men to school, September 94
Slag
—Raw material shortage plagues slag industry, January 122
Special machinery pays off for underground limestone producer, December 104
Standard Industries, Tulsa, Okla., July ...83
Statistical tools monitor kiln operation, August 91
Stearn, Enid W.
—Case history of a blast, June 93
—Safety is the badge of a pro, December 100
—Send your service men to school, September 94
—Union demands swell—cement producers worry, April 96
—What's the mood of the lightweight aggregates industry? November 70
Stockbridge Stone Div. of Vulcan Materials Co., Columbus, Ga., February . 86
Surge piles displace stockpiles, July 83

T

Taiwan cement producers forge ahead, May 172
Tanaka, Tatsuo
—What do you know about bin design? February 115
Television
—Television goes underground, December 96
Texas Agricultural Limestone Association
—Publicity sells ag-lime, February 110
Thompson-Strauss Quarries, Inc., Kansas City, Kan., December 104
Thomson, Pat
—Producers: watch your scale weight, June 122
Tilt your drill—improve efficiency, January 109
Today's theories set tomorrow's practice, January 99
Torgerson, Ralph S.
—Lime plant saves San Diego money, August 78
—New research lab probes concrete products, June 102
Tough limestone yields to hammermills, September 130

U

Union demands swell—cement producers worry, April 96
Universal Atlas Cement Div., U. S. Steel Corp., Gary, Ind., July 102
Ushiro, Eitaro
—Cement mill profits from paper mill waste, September 136

V

vonHillebrandt, Fred
—Belt conveyor system masters terrain, October 116

W

Weighing
—Producers: watch your scale weight, June 122
Welding shops can help cut your hardfacing budget, Part 2, October 97
Western Gypsum Products, Ltd., Vancouver, B.C., November 82
What do you know about bin design? February 115
What do you know about dispersion agents? May 180
What's the mood of the lightweight aggregates industry? November 70
Where does the Interstate Highway Program stand today? Part 4, July 76
White cement debuts on West Coast, May 153
Wiley, George
—How to lubricate cement mill bearings, February 104
Will Congress resolve money troubles on the Interstate system? April 80

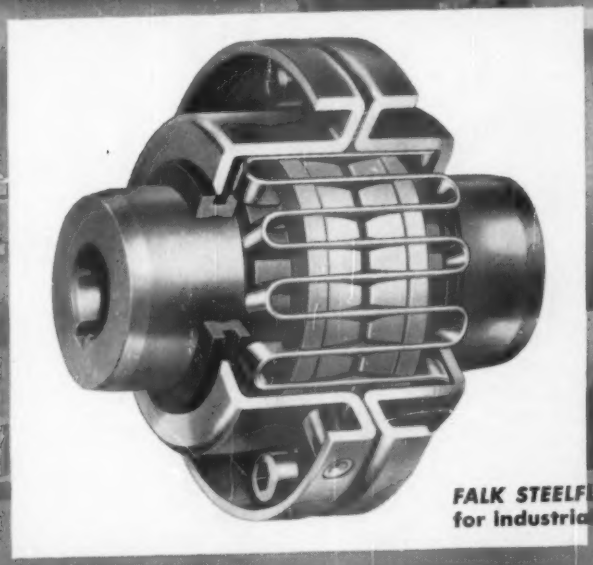
XYZ

You can jump profits with good maintenance, September 86
Yano, Tsuyoshi
—Cement mill profits from paper mill waste, September 136
Ziehm, A. F.
—Rubber-lined pumps can cut operating costs, November 101
Zoning
—Gravel producers do win zoning battles, February 97

Enter 1283 on Reader Card

FALK

A GOOD NAME IN INDUSTRY



FALK STEELFLEX COUPLINGS
for industrial applications...large or small

Giant Falk Coupling smooths out steel blooming mill performance

On a blooming mill at the Copperweld Steel Company plant in Warren, Ohio, installation of a large Falk Steelflex coupling between motor and pinion stand eliminated troublesome noise and vibration which threatened to damage mill machinery. Transmitting 5,000 hp at 50/100 rpm, this is not the largest Falk coupling... others are designed to transmit up to 130,000 hp at 100 rpm.

This installation and others like it prove the Falk concept of shaft coupling design—namely, a modern shaft coupling must contribute to the successful performance of the machinery system.

What does this mean to you? Just this: On large machines as well as small, the exclusive Falk grid-groove design does make a difference, and the difference is torsional resiliency with the strength of steel...reason enough to specify Falk Steelflex couplings as "long life" insurance for your connected machinery.

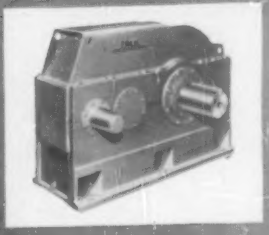
Falk Steelflex couplings are available in standard designs in 34 sizes for applications from .3 hp at 100 rpm to 130,000 hp at 100 rpm, with excellent delivery. Write for Bulletin 4100.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS
Representatives and Distributors in most principal cities

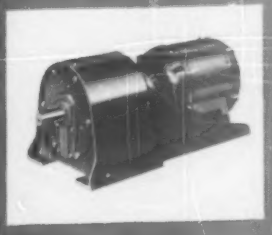
• • •

A Point to Ponder... When you need gear drives or shaft couplings of "FALK OR EQUAL" quality, where but from Falk can you get the "OR EQUAL"?

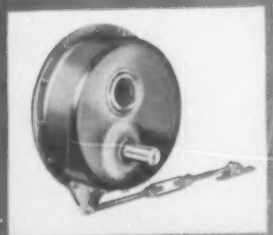
Other members of America's First Family of Power Transmission Products



SPEED REDUCERS
Parallel Shaft up to 3500 hp. Ask for Bulletin 1100. Also Right Angle and Concentric Shaft designs.



ALL-STEEL MOTOREDUCERS
—up to 75 hp. Horizontal, Vertical, and Right Angle. All-Motor and Integral Types. Ask for Bulletin 3100.



SHAFT-MOUNTED DRIVES
—up to 125 hp. Ask for Bulletin 7100. Also Flange Mounted and Screw Conveyor Drives.

FALK, STEELFLEX and ALL-MOTOR are registered trademarks

HERE ARE YOUR TOOLS TO KEEP KILN COSTS DOWN

1 Aztex® or Big Savage High Duty Firebrick Liners for discharge zone

2 Unitab® Kiln Liners* (periclase chrome basic liners) or Alumex® 70 for the hot zone

3 Jay-Bee® or Rajah Firebrick Liners for the intermediate zone

4 Aztex or Big Savage High Duty Firebrick Liners for preheating zone

5 Hi-Strength Abrasion Resistant Castable, Aztex or Big Savage Firebrick Liners for the drying zone

From one source—your Kaiser Refractories Sales Engineer can provide a wide range of brick and castables for the job of keeping your kiln costs down. In a unified refractory plan he shows how you can use the right material for most economical performance in each area. Most important, he brings extra experience in modern unitized liners from the originator of the first—and still best—unitized liner for hot zones: Kaiser Unitab.

FOR INFORMATION AND YOUR COPY OF "REFRACTORIES FOR ROTARY AND VERTICAL KILNS" CONTACT OUR NEAREST OFFICE:

Oakland 12, Calif. . . 300 Lakeside Drive
Mexico, Missouri . . . Mex-R-Co Bldg.
Pittsburgh 22, Pa. . . . 3 Gateway Center

(CANADIAN SUBSIDIARY: REFRACTORIES ENGINEERING AND SUPPLIES, LTD.)

*U.S. PAT. NO. 2829977

KAISER REFRACTORIES

Watch FOLLOW THE SUN and MAVERICK, Weekly, ABC-TV Network